CHRISTIE

DIGITAL SYSTEMS

Operating Instructions

For

CineX35

35mm Film Projector

Analog/Digital, Auto Turret Model CineX35-DAT(Z)

Analog, Auto-Turret Model CineX35-AT(Z)

Analog/Digital, Manual Turret Model CineX35-DM(Z)

Analog, Manual Turret Model CineX35-MT(Z)

115VAC, 60Hz Motor *or* 220VAC, 50Hz Motor

TD-747: Version 1.0

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Operator's Manual
CineX35-DMT(Z)/CineX35-DAT(Z)
CineX35-MT(Z)/CineX35-AT(Z)
TD-747

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1

1. INTRODUCTION

1.1. CONTENTS OF THE MANUAL

This manual contains installation, operation, and operator maintenance procedures for CHRISTIE CineX35 film Projector models. The material covered includes:

- general description
- installation and assembly
- operating the projector
- periodic maintenance
- calibration, alignment, and adjustments
- troubleshooting.

1.2. WHO SHOULD USE THIS MANUAL?

This manual provides information suitable for various purposes. For details on operating the projector and for general information, see:

- *Section 2: General Description*
- *Section 3: Installation and Assembly*
- *Section 4: Operating the Projector.*

Before performing adjustments and periodic maintenance during normal operation, see:

- *Section 5: Periodic Maintenance*
- *Section 6: Calibration, Alignment, and Adjustments*.

If a problem occurs, see:

- *Section 7: Troubleshooting Procedures.*

Additional reference information is contained in the appendices.

1.3. SPECIAL NOTICES

Three kinds of specific notices are used within this manual to emphasize specific information.

1.3.1. WARNING

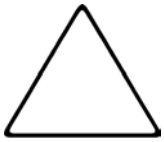
WARNING

WARNING: Indicates the presence of a hazard that can cause personal injury if the hazard is not avoided.

1.3.2. CAUTION

CAUTION: Indicates the presence of a hazard that could cause damage to projection system.

1.3.3. NOTE



NOTE: Provides additional information.

2

2. GENERAL DESCRIPTION

The CHRISTIE CineX35 film Projector, manufactured exclusively by CHRISTIE DIGITAL SYSTEMS is a dual-lens 35mm motion-picture projector that employs a revolutionary sealed-bearing intermittent movement called the Ultramittent©. This movement coupled with uncompromising design and assembly workmanship, results in the finest possible theater picture reproduction. The Ultramittent movement is standard on all CHRISTIE projectors.

2.1. OPTIONAL FEATURES

Options available for enhancing the standard features of the CineX35 projector include:

- manual dual-lens turret
- automatic dual lens turret, including automatic aperture changer
- inboard Dolby digital reader
- all models available in 50 Hz or 60 Hz

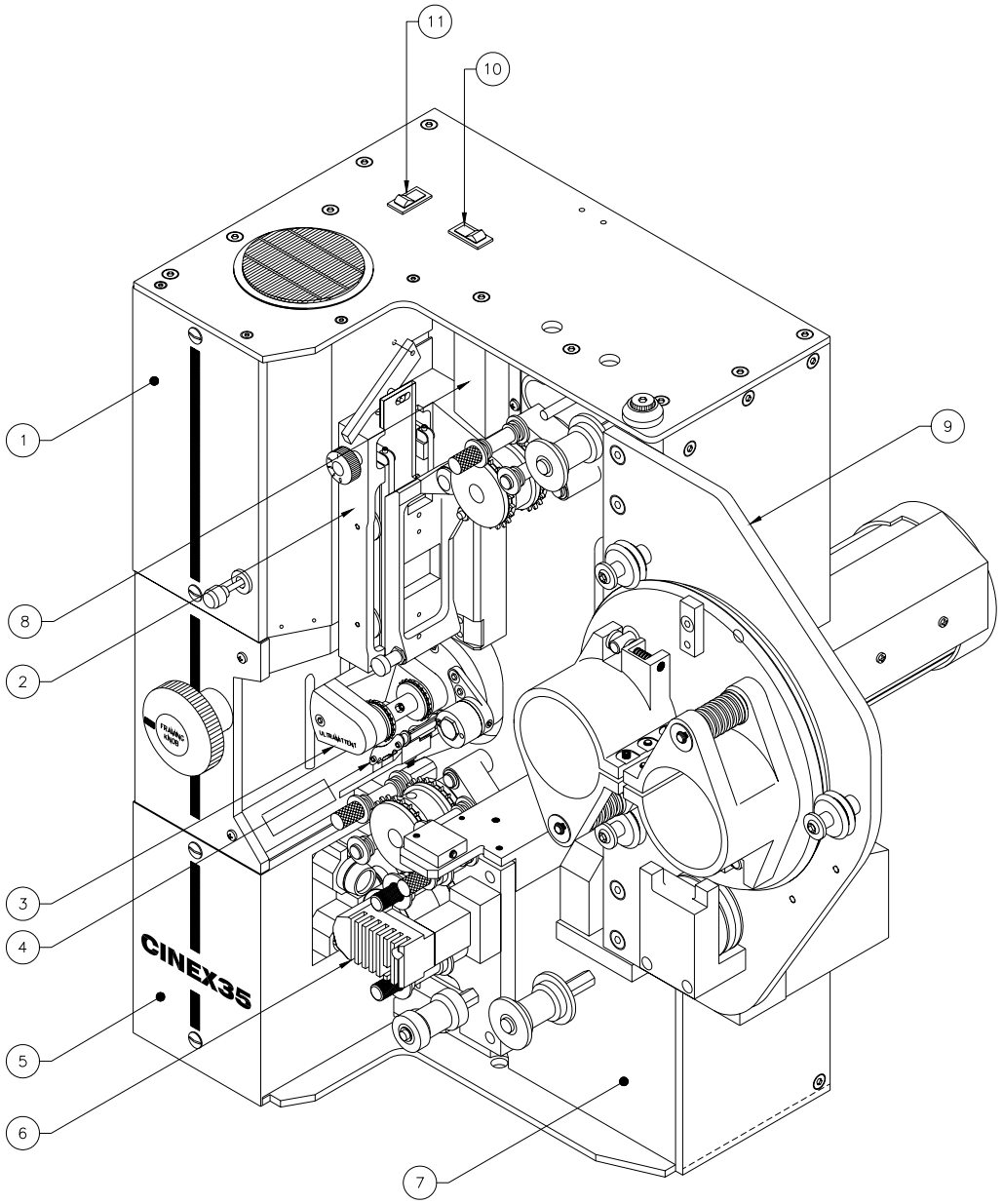
2.2. SPECIFICATIONS

Standard specifications for the CineX35 projector family are listed in the Table shown in Figure 2-1, below.

POWER REQUIREMENTS:		
Input Voltage		115 VAC, 5 Amp, 60 Hz
	OR	220 VAC, 3 Amp, 50 Hz
DIMENSIONS:		
Height		23 inches
Width		17 inches
Depth		21 inches (with motor)
WEIGHT:		88 lb. (40 kg)
FILM SPEED:		Standard: 24 frames/sec (90 ft/min)
OPERATING TEMPERATURE:		0 to +45°C
MOTOR:		Synchronous split phase, 1800 rpm, 60 Hz
	OR	1500 rpm, 50 Hz

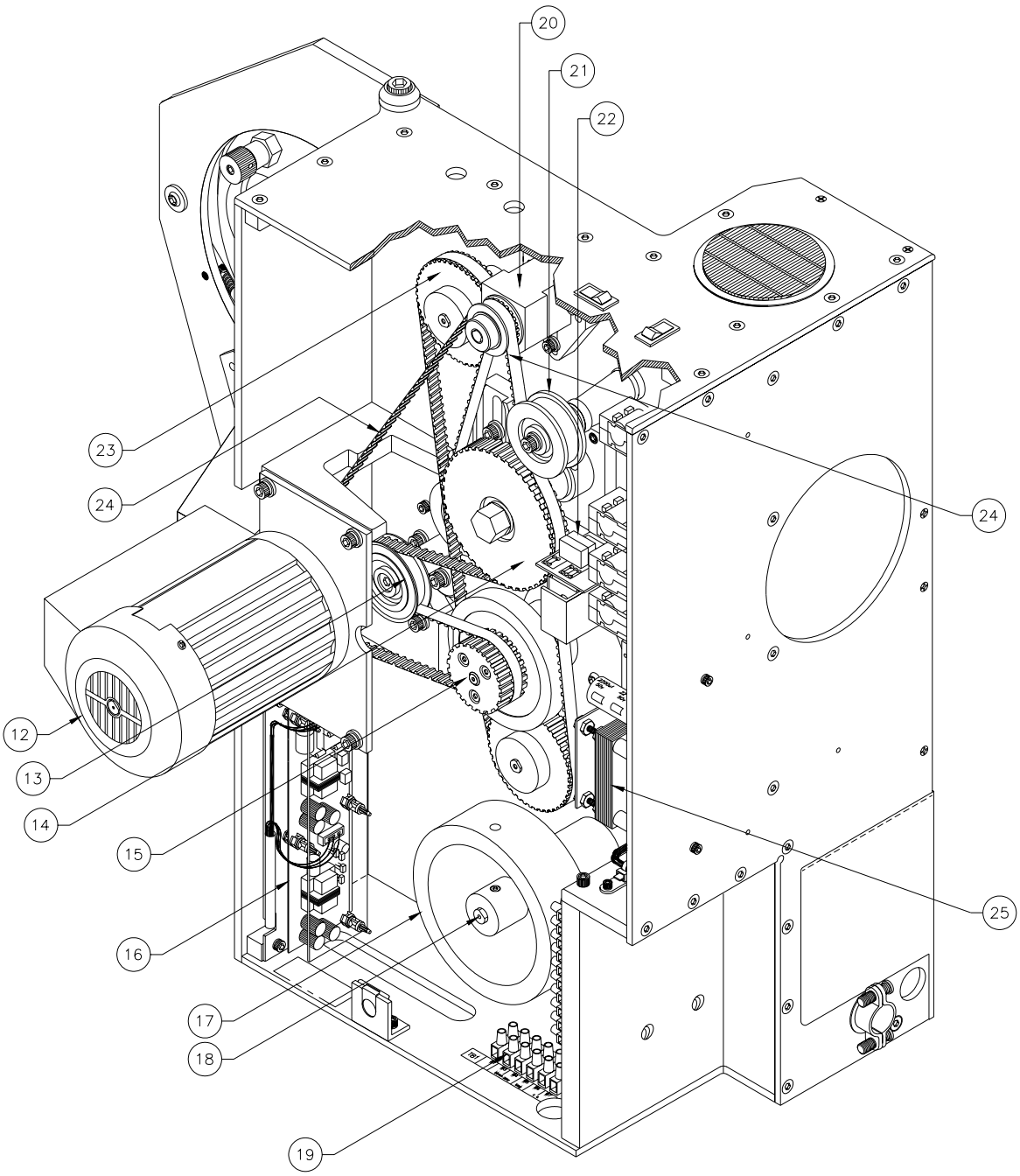
Figure 2-1: Table of Equipment Specifications

These specifications may vary slightly, depending upon the particular model and options chosen.



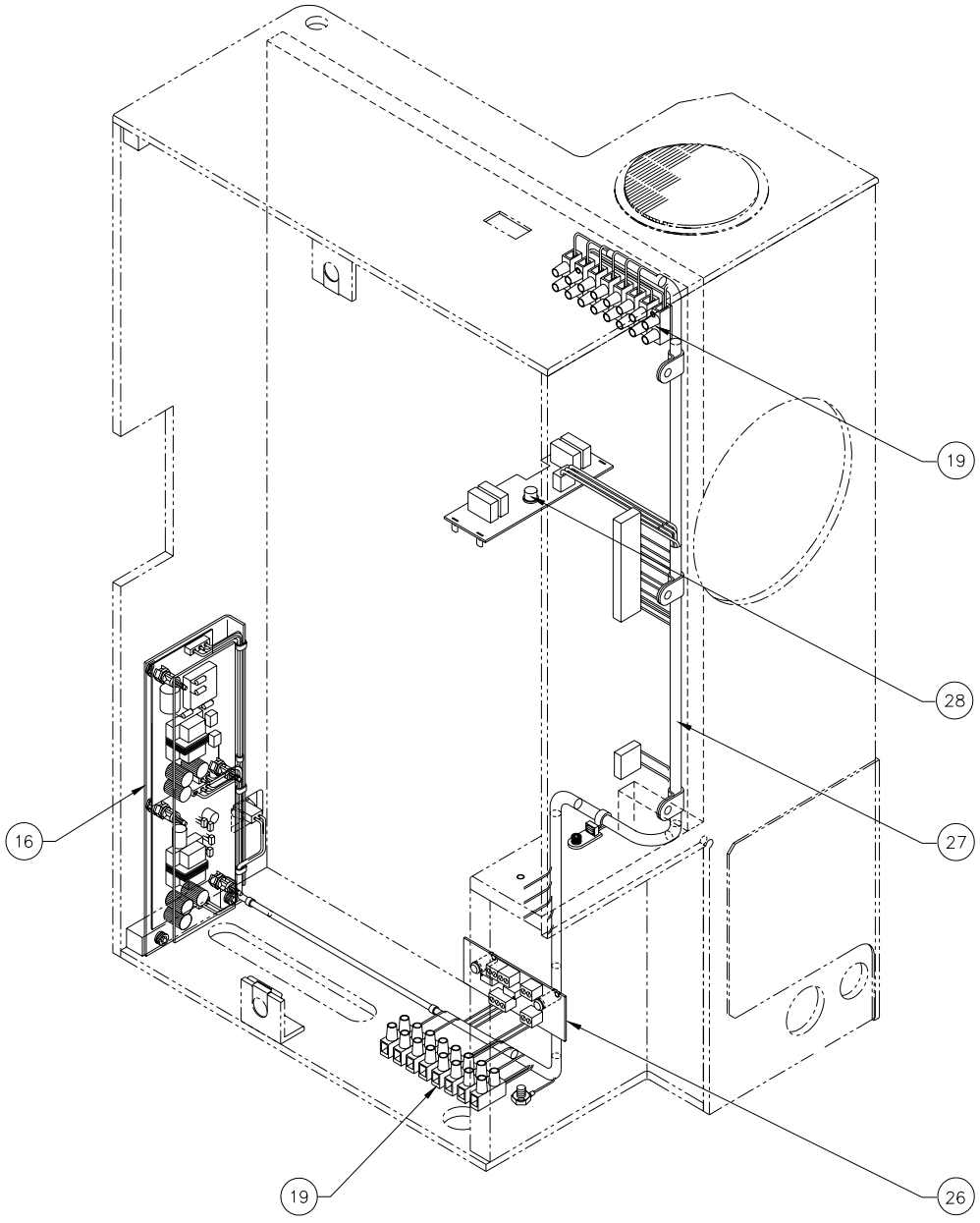
1. Door, Framing Lamp (197576-001
2. Trap and Gate Assembly (197552-001)
3. Ultramittent Assembly (119450-005)
4. Ultramittent Shoe Closure (197578-001)
5. Door, Sound Readers (197549-001)
6. Sound Head Assembly (197510-001)
7. Main Frame Assembly (197560-001)
8. Shutter Belt Cover (194600-001)
9. Basic Turret Assembly (197100-100)
10. Switch, Flat-Scope (578900-040)
11. Switch, Framing Lamp (578900-042)

Figure 2-2: Projector, Front View



12. Motor Assembly 60-Hz (197553-001)
    Motor Assembly 50-Hz (197553-002)
13. Idler Roller Assembly (194879-001)
14. Shutter Drive Assembly (197137-XXX)
15. Pulley 30 Grooves, Ultramittent (197516-001)
16. Power Supply Assembly, Sound-Head (197090-001)
17. Flywheel, Sound Drum (119166-001)
18. Shaft, Sound Drum (196315-001)
19. Terminal Block Euro 10MM (586210-008)
20. Jackshaft Assembly (197551-001)
21. Outer Belt Tensioner (197583-001)
22. Light Baffle & Changeover (197550-001)
23. Pulley, 48 Grooves (2 PLS) (197517-001)
24. Belt 5MR-1050 (2 PLS) (598931-177)
25. Turret Auto Control, Option (197580-001)

Figure 2-3: Projector, Rear View



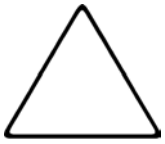
26. Dual LED Regulator (197084-001)
27. Harness (197080-001)
28. Fuse 1A, 250V, SLO-BLO (546101-012)

Figure 2-4: Projector

3

3. PROJECTOR INSTALLATION AND ASSEMBLY

3.1. UNPACKING THE PROJECTOR



Before opening box (es), carefully inspect outside of carton(s). If carton has been damaged, notify shipper immediately; do not open carton unless instructed to do so.

The CHRISTIE projector may be shipped in more than one container. Each projector normally comes complete with the following items:

- dual aperture plate (shipped in place)
- framing lamp (installed)
- sound-head flywheel (not installed)
- sound-head assembly (factory-aligned)
- dual-lens turret
- drive motor assembly
- instruction manual.

The console and projector are shipped in a single carton, with special pockets containing smaller items. Sound-head flywheel are shipped separately.

To unpack:

1. Open carton(s).
2. Remove all protective material from framing lamp, sound-head assembly, and lens holder.
3. Remove protective material around side panel.

3.2. INSTALLATION

To install the projector, refer to Figure 3-1. The required materials and tools for installing and assembling the projector are outlined in the Table in Figure 3-2.

1. Loosen but *do not remove* nut on projector mounting stud (item 4 in Figure 3-1). Verify that lock washer (item 5 in Figure 3-1) and flat washer (item 6 in Figure 3-1) are correctly positioned on mounting stud. Flat washer should be next to lock washer, followed by nut.

2. Insert lock washer (item 2 in Figure 3-1) and flat washer (item 3 in Figure 3-1) onto hex bolt (item 1 in Figure 3-1). Insert hex head bolt, with lock washer and flat washer, into upper left opening of projector mount. Rotate hex head bolt four full turns.
3. Lift and mount projector to console or pedestal. Thread two remaining hex head bolts with lock washer and flat washer. Insert into two bottom mounting holes on projector.
4. Level projector on lamp-house or pedestal.
5. Tighten nut on mounting stud using 9/16" wrench.
6. Tighten three hex head bolts using same wrench.

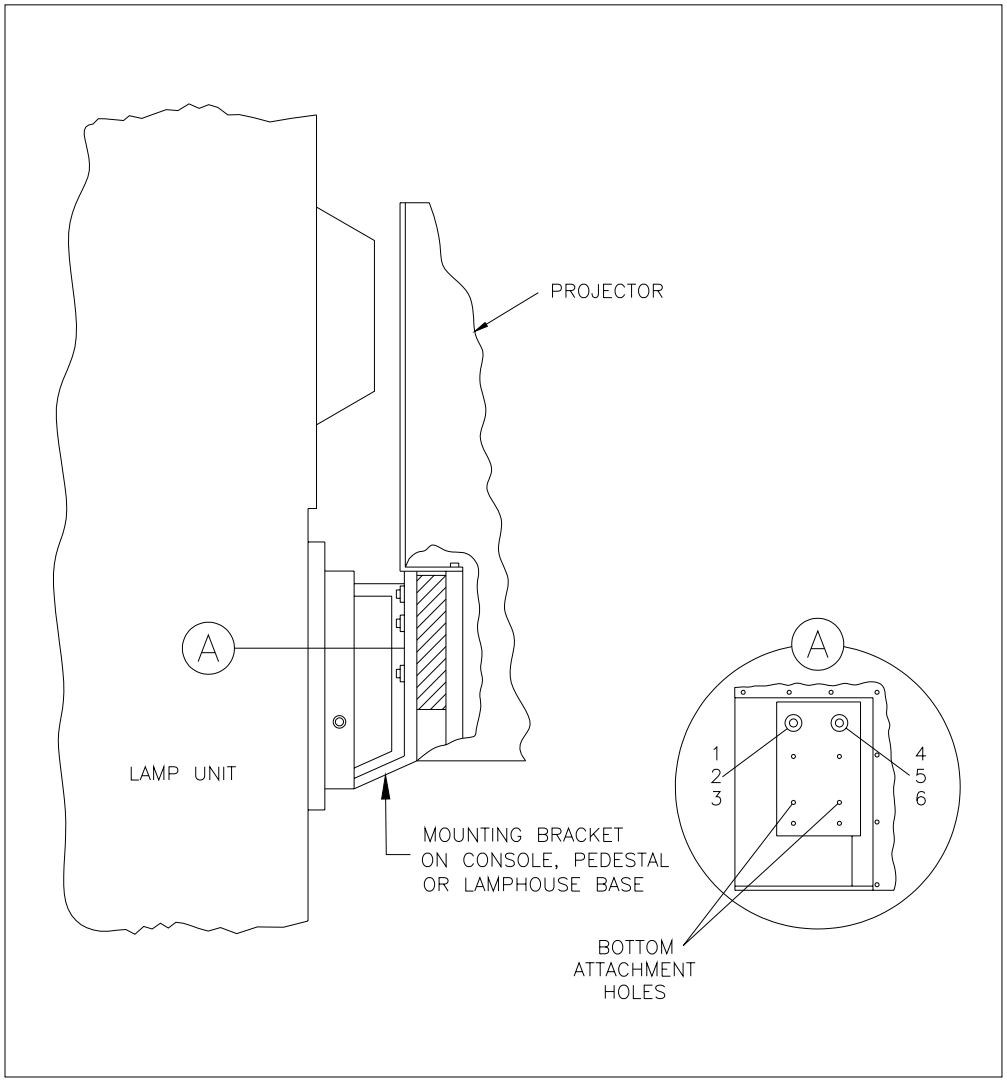


Figure 3-1: Installing the Projector

Category	Item	Use
Tools	Miscellaneous Allen wrenches	General Maintenance
	Small standard screwdriver	
	Phillips screwdrivers	
Equipment	Oscilloscope	Sound-head Alignment
	Voltmeter	
	Real-time Analyzer	
	SK1994-3 alignment tool	Lateral Guide Alignment
Materials	P35-BT (SMPTE)	Buzz Track Test Loop
	P35-FL	Flutter Loop
	Cat 69 Loop	Dolby Tone, Pink Noise
	Cat 566 Loop	Illumination Uniformity
	Cat 97 Loop	Left/Right Alignment
	RP-40 Loop	Optical Alignment

Figure 3-2: Tools and Materials Required for Assembly and Maintenance

3.3. ELECTRICAL CONNECTIONS

Before wiring the projector, refer to Figure 3-3 for the wiring interface diagram. Use stranded wire. Strip and tin the wire prior to connection. Use crimp connectors on all sound connections. For projectors equipped with an automatic turret, refer to Section 6.6.3.

3.3.1. SOLAR CELL WIRING

Solar cell wiring requires a shielded, four-conductor audio cable. (red – left (+), black – left (-), green – right (+), white – right (-)). The best signal-to-noise ratio is achieved by maintaining the same ground potential between the sound-head and the cinema processor. Refer to the directions in the sound system instruction manual for proper connection of the sound system.

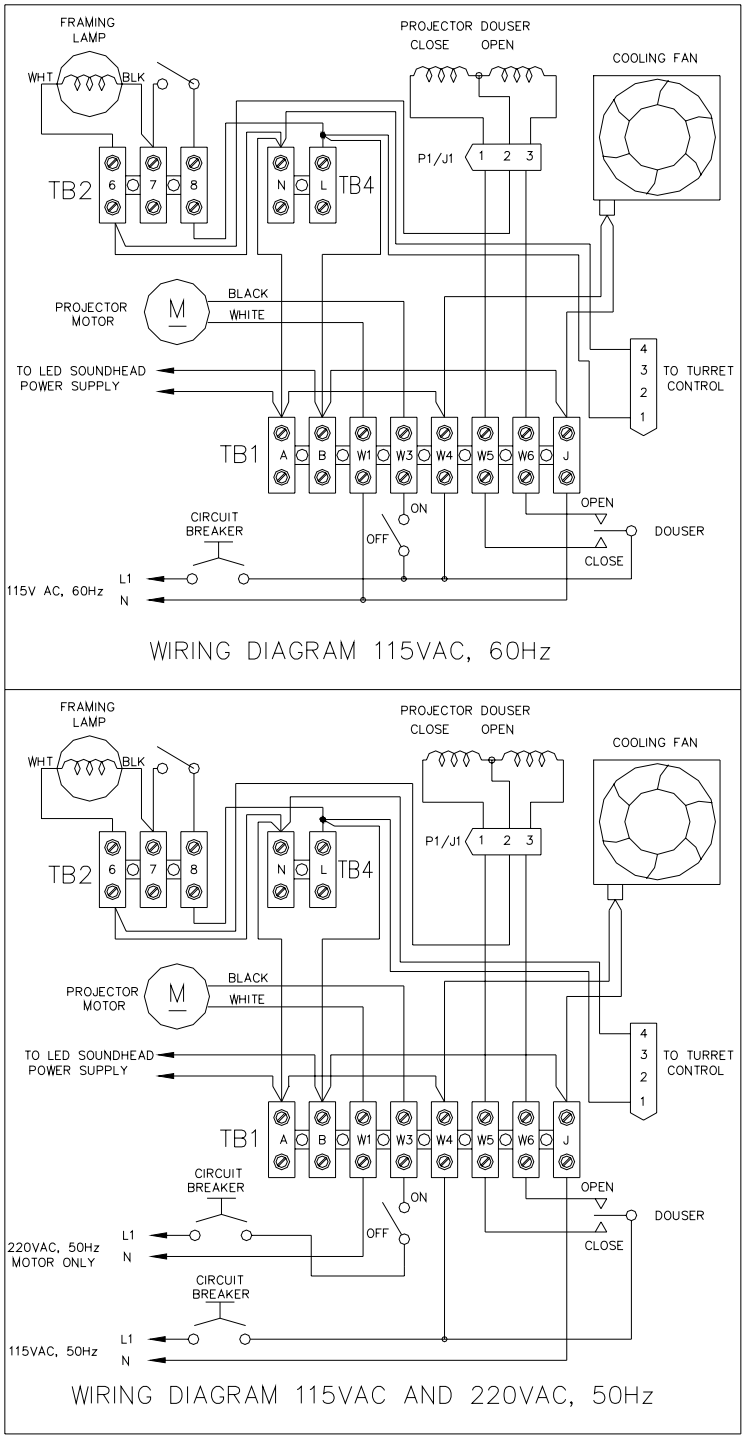


Figure 3-3: Projector Wiring Diagram (50- and 60-Hz models)

3.3.2. A-C PROJECTOR WIRING

AC wiring to the projector requires stranded, 14-gauge wire. Be sure to follow local and national electrical codes for A-C wiring. The terminal connection numbers in the table in Figure 3-4 refer to terminals TB-1 in Figure 3-3.

Terminal TB1	Connection
A	Power Supply (AC-hot)
B	Power Supply (AC- neutral)
W1	Motor (AC neutral)
W3	Motor switch lead (AC hot, switched externally)
W4	Cooling Fan, Turret Control (AC-hot)
W5	Douser coil CLOSE (AC-hot switched externally)
W6	Douser coil OPEN (AC-hot switched externally)
J	Cooling Fan, Turret Control and Douser (AC neutral).

Figure 3-4: Table of A-C Terminal Connections

The voltage and frequency rating of the projector (shown on the nameplate) *must* match the power line frequency and voltage being used.

4

4. OPERATING THE PROJECTOR

4.1. GENERAL

Before operating the projector, verify that all phases of installation and assembly have been completed.

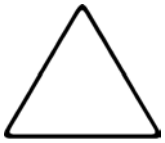
WARNING

- **Verify that cover for belt side of projector is installed before and during operation.**
- **Do not make adjustments on belt side of projector while cover is removed and power is on.**
- **Do not make adjustments or perform maintenance on projector while it is in operation.**

4.2. PRE-OPERATING PROCEDURES

4.2.1. FLYWHEEL INSTALLATION

1. Back out flywheel set screw far enough to let flywheel slide onto shaft without scoring shaft or damaging threads on set screw.
2. Slide flywheel onto shaft until it stops.
3. Position set screw over flat portion of shaft and tighten set screw.
4. Spin flywheel by hand to check for smooth operation.



CHRISTIE recommends that any projector accessories be installed at this time.

4.2.2. LENS INSTALLATION

1. Install lens system in lens holder. If it is necessary to open lens holder wider than normal:
   a) Loosen two lens-locking screws.
   b) Turn jack screw clockwise until lens slides into lens holder; turn the screw back.
2. Set focus knob at mid-position.

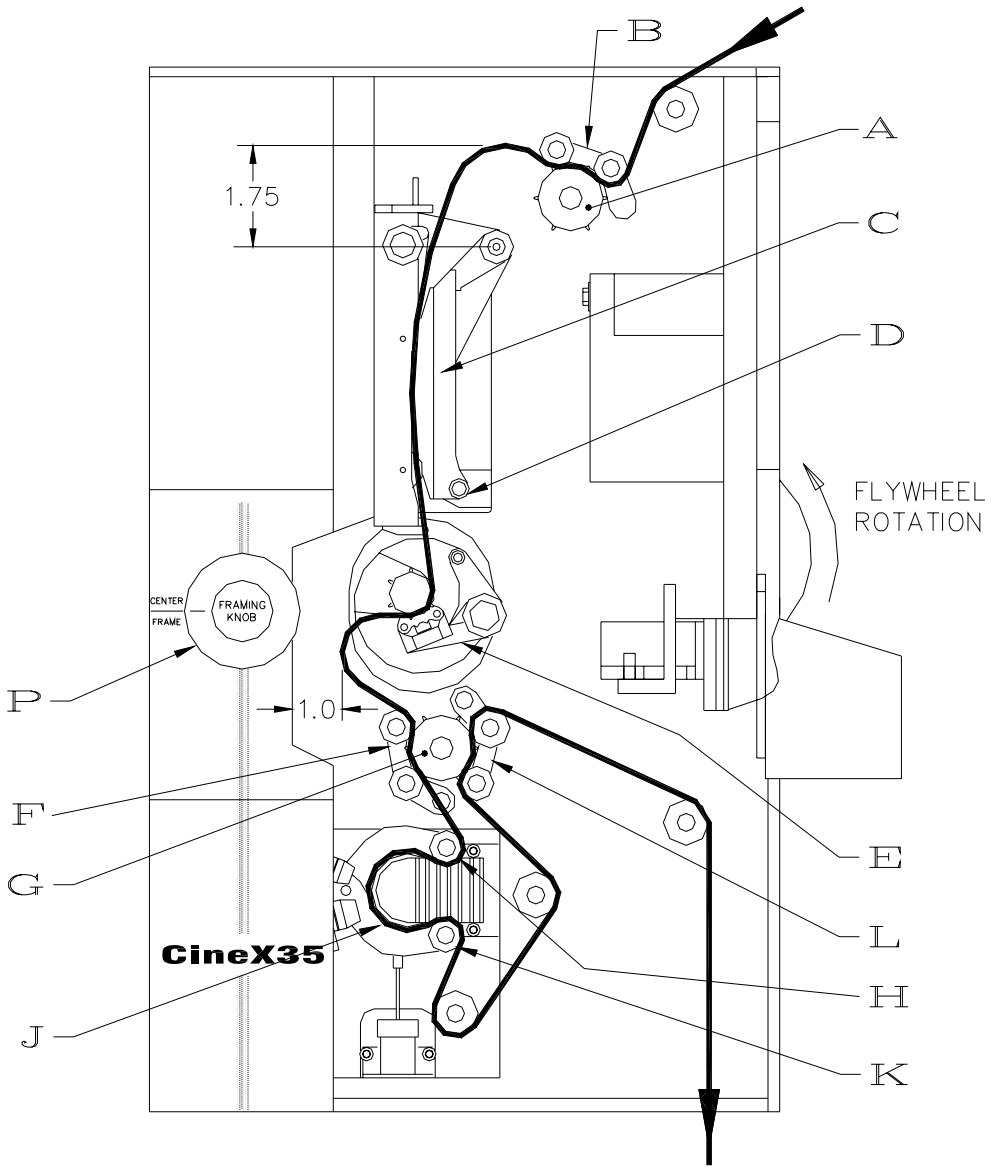
3. Secure lens system with two locking screws.

Over-tightening can cause focus mechanism to bind.

4.3. FILM THREADING AND OPERATING PROCEDURE

Refer to Figure 4-1 for film threading and positioning using flywheel.

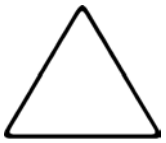
1. Set Ultramittent to its rest position. There should be no sprocket movement when motor flywheel is turned.
2. Center framing knob (P) by aligning mark on knob with line on projector housing marked CENTER FRAME.
3. Swing out pad rollers (B, F, L) on constant-speed sprockets (A & G).
4. Swing out film shoe on Ultramittent assembly (E).
5. Pull out catch knob (D) and swing out gate assembly (C).
6. Using slightly more film length than is required to reach film transport system, begin to thread film into projector.
7. Align film on Ultramittent sprocket and close Ultramittent film shoe.
8. To form proper loop between Ultramittent and lower constant-speed sprocket:
   a) Pull film loosely over lower constant-speed sprocket, form loop as shown on Figure 4-1.
   b) Mate film sprocket holes with sprocket pins.
   c) Hold film in position and close pad rollers.
9. Thread film on sound-head assembly as shown in Figure 4-1:
   a) Holding two lateral guide rollers (H and K) towards each other, pull film tight and align film on lower constant-speed sprocket assembly (G).
   b) Tighten film on one sprocket hole so lateral guides barely float off sound drum.
   c) Close pad rollers (L) of lower constant-speed sprocket.



A: Upper Constant Speed Sprocket	G: Lower Constant Speed Sprocket
B: Pad Rollers, Upper Speed Sprocket	H: Lateral Guide Roller (Upper)
C: Gate Assembly	J: Sound Drum
D: Catch knob	K: Lateral Guide Roller (Lower)
E: Ultramittent Shoe Assembly	L: Pad Rollers, Lower Constant Speed Sprocket
F: Pad Rollers, Lower Constant Speed Sprocket	P: Framing Knob

Figure 4-1: Threading Diagram

10. Form 1.75-inch loop between upper constant-speed sprocket and gate (C), as shown in Figure 4-1
11. Align the film on upper constant-speed sprocket (A) and close pad rollers (B).
12. To verify that film is correctly aligned on all sprocket rollers, move motor flywheel counterclockwise.



- **Framing lamp can be turned "on" or "off" with black rocker switch located on top of projector.**
- **Framing lamp is functional with picture changeover in either position.**
- **If film reel is used, be sure take-up tension is in accordance with reel manufacturer's instructions.**

5

5. MAINTENANCE

This projector has been designed to provide years of optimum performance while requiring only routine maintenance and cleaning. However, CHRISTIE strongly recommends a periodic maintenance program of scheduled operational checks and preventive maintenance.

5.1. GENERAL MAINTENANCE

Use the program outlined in the schedule in Figure 5-1 to maximize projector life and operating efficiency. Procedures for these operations are described in the referenced sections of this manual.

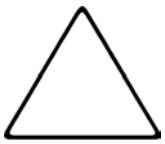
Frequency	Maintenance Operation	Section
Daily	Visual inspection	5.2
Daily	Clean projector	5.3
Bi-weekly	Oil lateral guides and jewels	5.3
Annually	Replace belts* and blow out belt dust	5.4.2

Figure 5-1: Schedule for Periodic Maintenance Operations

*** If Necessary**

5.2. VISUAL INSPECTION

1. Visually inspect projector for signs of excessive dust, dirt, physical damage, frayed or damaged cables, and loose hardware.
2. Remove, replace, and repair as necessary.
3. Visually inspect inner, outer, and shutter timing belts. Replace belts that are frayed or show signs of wear.
4. Check belt tension (Sections 6.4.1, 6.4.2, and 6.4.3) and re-adjust if necessary.



Ultramittent should be visually checked every 30 days. If leak is detected, contact CHRISTIE to arrange for loan of substitute Ultramittent. If leak is very slow, you may continue to operate Ultramittent for 30 to 90 days.

5.3. CLEANING

Projector should be kept clean at all times.

1. Remove dust and foreign matter from projector and assemblies. Use soft, lint-free cloth, or spray with compressed air at force no greater than 20 psi.
2. Using camelhair brush or toothbrush, remove dust and foreign matter from pad rollers, sprockets, Ultramittent shoe closure, and sound idler rollers, and from pads and shoes in trap and gate assembly.
3. Using cotton-tip swabs, remove dirt and dust from sound-head optics.
4. Lightly oil lateral guide rollers and springs with very fine machine oil (trap and gate). Inner flange of lateral guide should move easily and should spring back to rest position without sticking.

Do not adjust lateral guides without proper alignment tool (SK1994-3).

5.4. REMOVAL OF ASSEMBLIES

The following sections contain instructions and procedures necessary to remove assemblies and components from the projector. Use only the specified tools to perform these procedures. The use of any other tools will cause damage to the assemblies and components. Appendix A contains a list of replaceable assemblies and components and their part numbers.

Removal and replacement of the assemblies discussed in Sections 5.4.1 through 5.4.10 may be performed by the customer. The customer may also repair broken leads, solder connections. All other repairs and replacements are to be performed *only* by an authorized service representative. In general, any problem that does not appear to be treatable by a minor procedure should be treated by removing the defective assembly and returning it to CHRISTIE for repair.

5.4.1. REMOVAL OF THE TRAP AND GATE ASSEMBLY

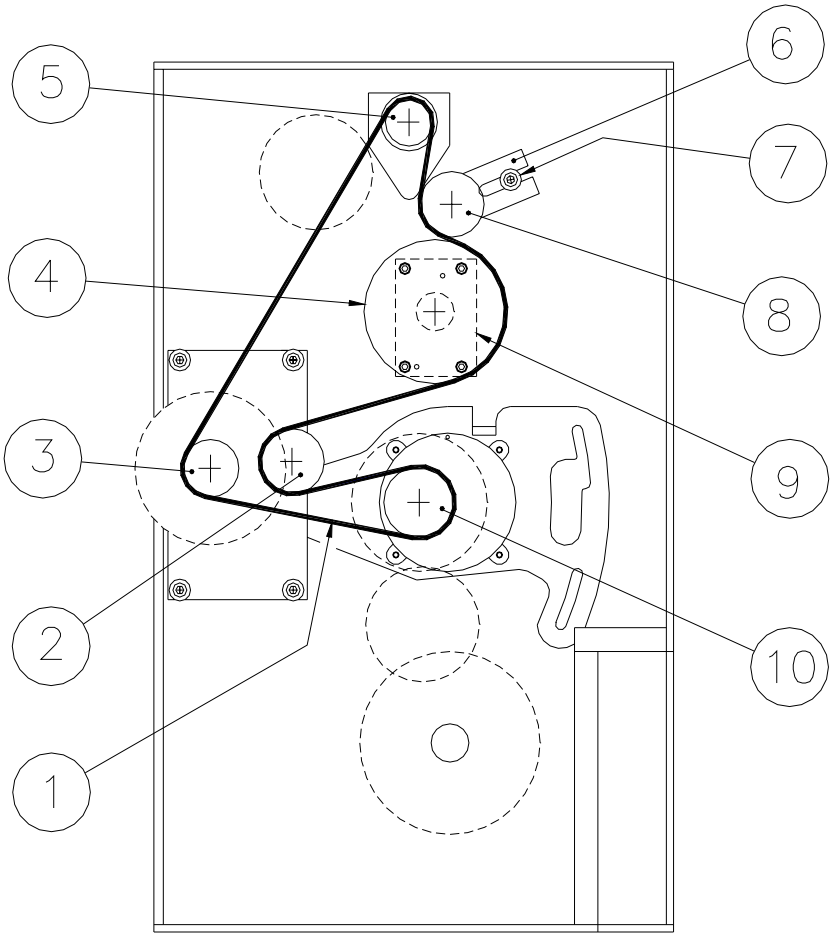
Refer to item 2 in Figure 2-2 on page 2-2.

1. Open trap and gate assembly by pulling catch knob.
2. Remove two socket head cap screws securing assembly to mainframe.
3. Remove assembly by gently pulling free from locating pins.

5.4.2. OUTER BELT

Refer to Figure 5-2 below.

1. Loosen outer belt tensioner screw (item 7 in Figure 5-2) and slide roller (item 8 in Figure 5-2) up to release tension on outer belt (item 1 in Figure 5-2).
2. Remove outer belt.



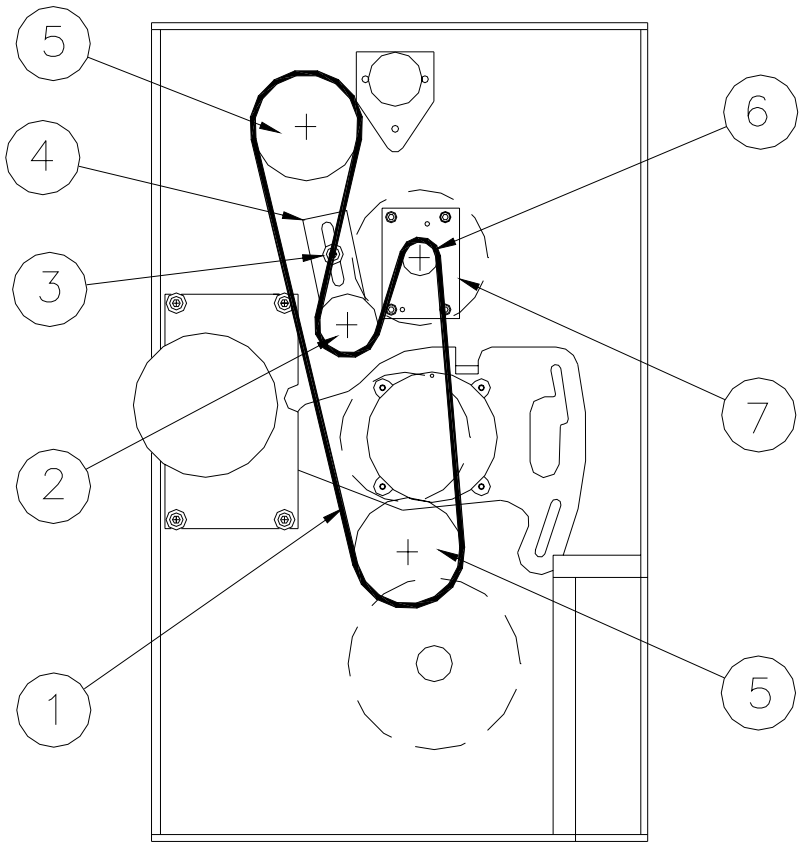
1: Outer Belt (598931-177)
2: Roller, Idler (194782-001)
3: Motor Pulley (197514-001 60Hz) (197514-002 50Hz)
4: Large Pulley (60teeth) (197518-001)
5: Jackshaft Pulley (197513-001)
6: Outer Belt Tensioner (197583-001)
7: Locking Screw, Outer Belt Tensioner (515500-105)
8: Roller, Outer Belt Tensioner (194782-001)
9: Shutter Drive Assy See Figure B-6 (197137-XXX)
10: Ultramittent Pulley (197516-001)

Figure 5-2: Outer Belt

5.4.3. INNER BELT

Refer to Figure 5-3 below.

1. Remove outer timing belt (see Section 5.4.2).
2. Loosen inner belt tensioner screw (item 3 in Figure 5-3).
3. Remove inner timing belt (item 1 in Figure 5-3).



1: Inner Belt
(598931-177)

2: Roller, Inner Belt Tensioner
(194782-001)

3: Locking Screw, Inner Belt Tensioner
(515500-105)

4: Inner Belt Tensioner
(196056-001)

5: Sprocket Pulley (Upper and Lower)
(197517-001)

6: Small Pulley (16teeth)
(197512-001)

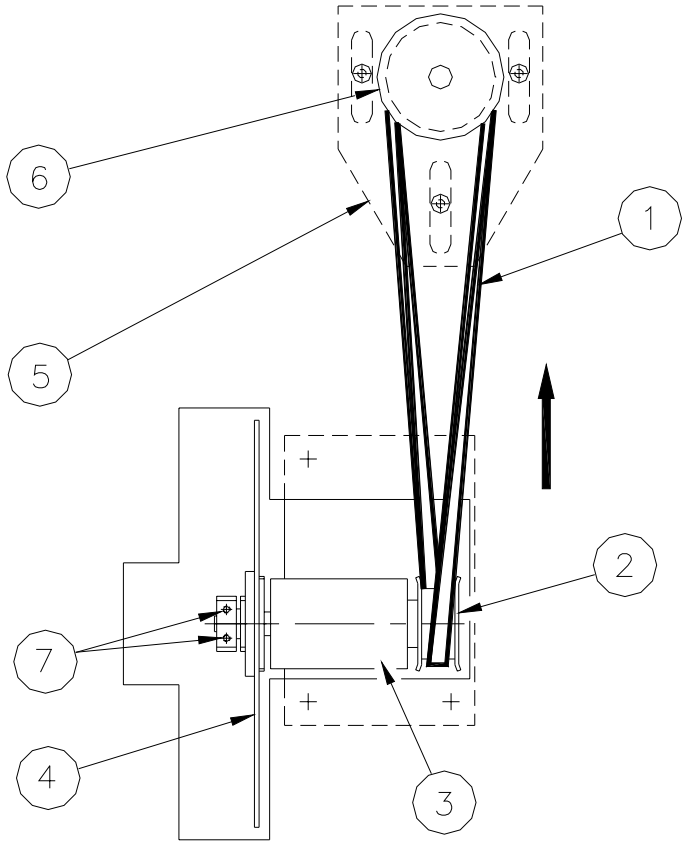
7: Shutter Drive Assy
See Figure B-6
(197137-XXX)

Figure 5-3: Inner Belt

5.4.4. SHUTTER TIMING BELT

Refer to Figure 5-4 below.

1. Remove trap and gate assembly (refer to Section 5.4.1)
2. Remove shutter belt cover (item 8 refer to Figure 2-2 on page 2-2).
3. Loosen three Allen head screws securing jack-shaft assembly to mainframe (item 5 in Figure 5-4) from non-operating side of projector.
4. Pull jack-shaft assembly down approximately 0.5 inch.
5. Remove shutter timing belt (item 1 in Figure 5-4).



1: Shutter Timing Belt (598931-533)

2: Pulley (Shutter Dr.) (194827-001)

3: Housing, Shutter Dr. (194915-001)

4: Single Blade Shutter Assy (194697-XXX) See Figure B-12

5: Housing Jackshaft (196469-001)

6: Pulley (Jackshaft) (194824-001)

7: Screw, SHC 6-32x1/2 (598931-042)

Figure 5-4: Shutter Timing Belt

5.4.5. ULTRAMITTENT ASSEMBLY

Disassembly of Ultramittent or attempted repair of components will void warranty.

Refer to item 3 in Figure 2-2 on page 2-2.

1. Relieve tension on outer timing belt (see Section 5.4.2).
2. Remove two Allen head screws securing Ultramittent shoe.
3. Remove Ultramittent shoe closure assembly (item 4 in Figure 2-2 on page 2-2)
4. Remove four Allen head screws and washers securing Ultramittent assembly to Ultramittent plate.
5. *Carefully* slide Ultramittent assembly out from non-operating side of projector.

5.4.6. REMOVAL OF SOUND-HEAD ASSEMBLY

Refer to item 6 in Figure 2-2 and Figure 2-3.

1. Remove flywheel sound drum (item 17 in Figure 2-3).
2. Open door of sound readers, which is secured by two quarter-turn fasteners (item 5 in Figure 2-2).
3. Disconnect LED leads at Dual LED Regulator.
4. Disconnect analog reader assembly connector.
5. Disconnect Video cable from digital reader assembly.
6. Remove four Allen screws in corners of base plate sound head.
7. Remove sound head assembly.

5.4.7. REMOVAL OF CHANGEOVER ASSEMBLY

Refer to item 22 in Figure 2-3 and Figure B-1.

1. Carefully pull four quick connect lugs from changeover solenoids (item 9 in Figure B-1).
2. Open framing lamp door (item 1 in Figure 2-1), which is secured by two quarter-turn fasteners.
3. Unscrew knob changeover (douser).
4. Remove four Allen screws (item 14 in Figure B-1) (which holds changeover assembly) through holes in light baffle assembly (item 1 in Figure B-1).
5. Remove changeover assembly out from non-operating side of the projector.

5.4.8. REMOVAL OF SHUTTER DRIVER ASSEMBLY

Refer to item 7 in Figure 5-3: Inner Belt on page 5-4.

1. Relieve tension on outer belt (Section 5.4.2).
2. Relieve tension on inner belt (Section 5.4.3).
3. Relieve tension on shutter timing belt (Section 5.4.4).
4. Remove four Allen head screws securing shutter driver assembly.
5. Remove shutter driver assembly.

5.4.9. REMOVAL OF MOTOR ASSEMBLY

Refer to item 12 in Figure 2-3 on page 2-3.

1. Disconnect motor's electrical leads at terminal block TB1-1 (item 19 Figure 2-3).
2. Relieve tension on outer timing belt (Section 5.4.2).
3. Remove cable ties holding motor cable in place by removing Allen head cap screws.
4. Remove four Allen head screws securing mounting plate with motor to motor bracket.
5. Remove motor assembly.

5.4.10. REMOVAL OF FRAMING LAMP

1. Open framing lamp door, which is secured by two quarter-turn fasteners (item 1 in Figure 2-2 on page 2-2).
2. Remove lamp as with ordinary light bulb.

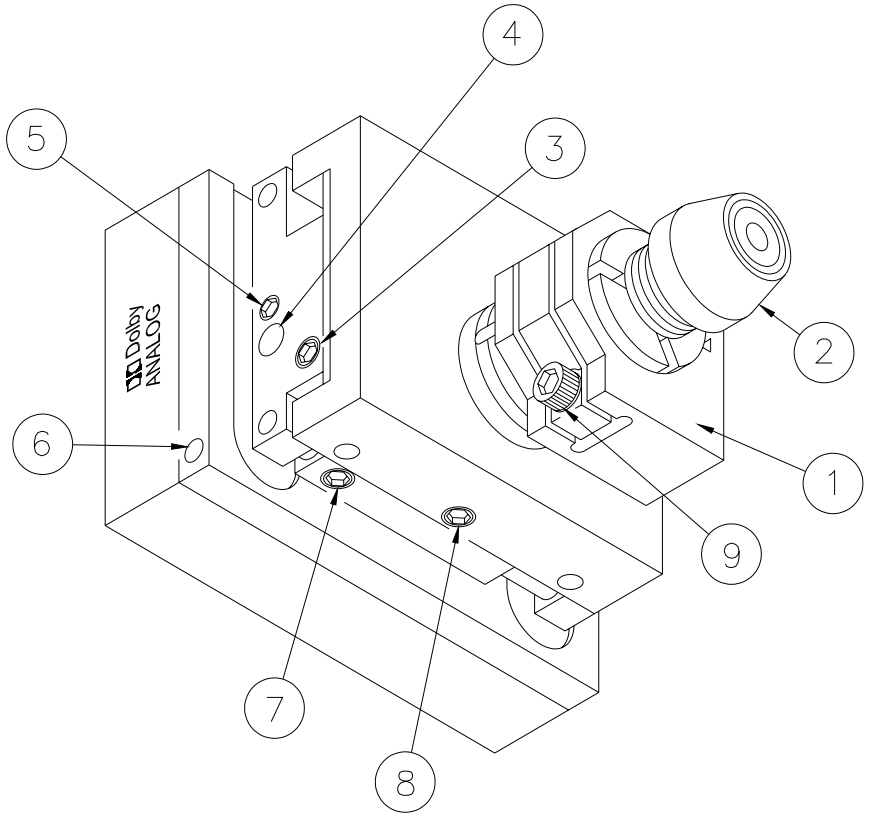
6

6. CALIBRATION, ALIGNMENT, AND ADJUSTMENT PROCEDURES

The projector has been factory aligned, calibrated, and adjusted prior to shipment. The following paragraphs contain the necessary information to calibrate, align, and adjust the various components and assemblies. Always observe standard safety precautions and maintenance procedures when working on the projector.

6.1. ANALOG READER ALIGNMENT AND ADJUSTMENTS

Refer to Figure 6-1 for these procedures.



1: Clamp Mounting
2: Focus Adjustment
3: Vertical Adjustment Locking Screw
4: Azimuth Adjustment Locking Screw
5: Horizontal Adjust.
6: Azimuth Adjustment
7: Horizontal Adjust. Locking Screw
8: Vertical Adjustment
9: Focus Adjustment Locking Screw

Figure 6-1: Analog Reader Assembly

6.1.1. PRELIMINARY PROCEDURES

Refer to Figure 3-2 on page 4 for a list of the tools, equipment, and materials required.

1. Verify that LED is operational and lens is clean.
2. Verify cell wiring for proper left/right wiring to cinema processor.

6.1.2. CELL POSITIONING: VERTICAL ALIGNMENT

1. Loosen 10-32-inch Allen set screw on side of assembly (item 3 in Figure 6-1).
2. Run Dolby Cat. 69 tone.
3. Adjust vertical position of cell (item 8 in Figure 6-1) for maximum output level.
4. Tighten locking screw on side of cell adjustment assembly. (Item 3 in Figure 6-1).
5. Adjust cinema processor's pre-amplifier gains for left and right tone reference levels.

6.1.3. HORIZONTAL (LATERAL) ALIGNMENT

1. Loosen 10-32 Allen locking screw on bottom of cell adjustment assembly (item 7 in Figure 6-1).
2. Run Buzz Track film.
3. Adjust lateral position of cell (item 5 in Figure 6-1) until there is no output at processor's test points. If output is present on both left and right test points, increase focal distance between lens and cell.
4. Tighten locking screw on bottom of cell adjustment assembly. (item 7 in Figure 6-1).

6.1.4. FOCUS AND AZIMUTH

1. Loosen 10-32 Allen locking screw in hole on side assembly (item 4 in Figure 6-1).
2. Turn cinema processor's pre-amplifier Hf adjustments counterclockwise to minimum settings.
3. Run Dolby Cat. 69 Pink Noise film (not older than 1992).
4. Adjust Focus (item 2 in Figure 6-1) and Azimuth (item 6 in Figure 6-1) for maximum high frequency response and phase coherence.
5. Carefully lock focus adjustment (9) and azimuth set screw (4).
6. Turn cinema processor's pre-amplifier Hf adjustments clockwise until real-time analyzer shows flat frequency response to 16 kHz.
7. Verify that both channels have identical frequency response.

6.1.5. ALIGNMENT VERIFICATION

1. Repeat vertical and horizontal alignment procedures described in Sections 6.1.2 and 6.1.3.

2. Recheck to verify that optimum alignment has been achieved.

6.1.6. PERFORMANCE CHECK: CROSSTALK

1. Run Dolby Cat. 97 cell alignment film.
2. Verify that there is no crosstalk between left and right processor test points.

6.1.7. ILLUMINATION UNIFORMITY

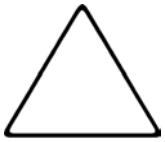
1. Run Dolby Cat. 566 illumination uniformity film.
2. Connect left and right processor test points.
3. Verify that illumination uniformity across cell is within ±0.5 dB.

6.1.8. FINAL CHECK

1. Verify Dolby tone reference levels.
2. Run Buzz Track film.
3. Verify frequency response and azimuth.
4. Check that all locking adjustments screws are tight.

Repeat appropriate procedures from Sections 6.1.2 through 6.1.7 if adjustments are necessary.

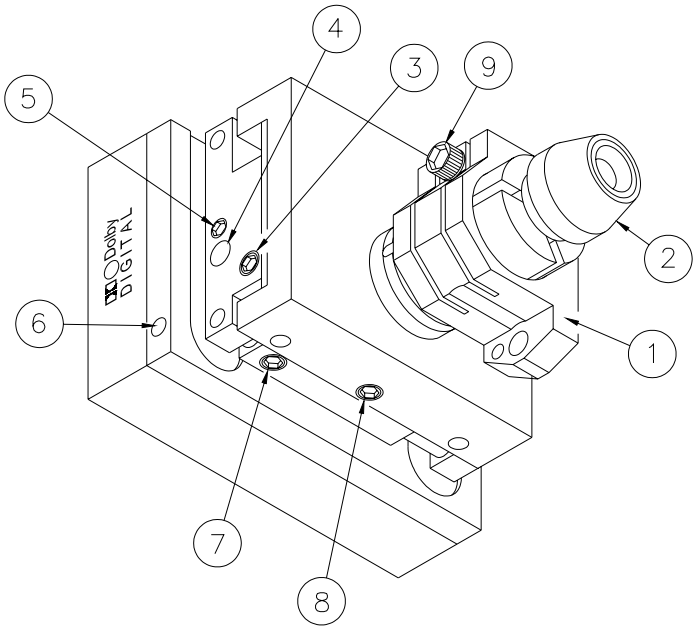
6.2. DIGITAL READER ALIGNMENT



The polarity of visible red LEDs may be opposite from that of infrared LEDs.

6.2.1. PRELIMINARY STEPS

1. Turn LED power supply down (CCW) to minimum.
2. Connect video cable to Digital Reader Assembly.
3. Turn on digital processor.
4. Apply AC power to projector and verify that LEDs are operational.



1: Clamp Mounting
2: Focus Adjustment
3: Vertical Adjustment Locking Screw
4: Azimuth Adjustment Locking Screw
5: Horizontal Adjust.
6: Azimuth Adjustment
7: Horizontal Adjust. Locking Screw
8: Vertical Adjustment
9: Focus Adjustment Locking Screw

Figure 6-2: Digital Reader Assembly

6.2.2. ALIGNMENT PROCEDURE

1. Remove analog reader assembly, or rotate assembly downward, for easier access to Digital Reader Assembly.
2. Set adjustment assembly to center of travel path in both horizontal (item 5 in Figure 6-2) and vertical (item 8 in Figure 6-2) directions.
3. Run film loop with Dolby Digital track.
4. Adjust vertical positioning by pivoting entire assembly (item 1 in Figure 6-2) and fine vertical adjustments (item 8 in Figure 6-2) to achieve maximum video signal on oscilloscope.
5. Adjust with threaded lens holder (item 2 in Figure 6-2) at front of assembly to obtain highest possible focus reading on DRAS or QC software.

Digital reader has been factory-aligned to meet Dolby specifications. Field adjustment requires oscilloscope and either DRAS or QC software.

6. Adjust azimuth (item 6 in Figure 6-2) to read zero ±2 mils with DRAS or QC software.
7. Adjust lateral positioning (item 5 in Figure 6-2) to center image on CCD. It should read zero ±0.5 mils on DRAS or QC software.
8. Magnification should be 100 ±2%; adjust focal distance if necessary.

9. Adjust LED power supply output for 4 ±0.5V of video amplitude if necessary.
10. Lock all adjustment screws (items 3, 4, 7, and 9 in Figure 6-2).

6.3. DASHPOT ADJUSTMENT

1. Turn hex-slotted screw counter clockwise at bottom of dashpot assembly until friction of dashpot is at lowest point.
2. Run wow and flutter test film and increase friction by turning hex slotted screw, at bottom of dashpot assembly, clockwise until best result is obtained.

6.4. INNER, OUTER, AND SHUTTER TIMING BELT ADJUSTMENT

WARNING

NEVER adjust belts with power applied!

Belt tension should be kept as loose as possible while remaining tight enough to drive all mechanisms. To adjust belt tension, follow procedures in Sections 6.4.1 through 6.4.3.

Do not over-tighten belts. If belts are too tight, projector will not operate properly, and projector parts will wear prematurely.

6.4.1. INNER BELT

Refer to Figure 5-3 on page 5-4.

1. Loosen inner belt tensioner locking screw (item 3 in Figure 5-3).
2. Adjust inner belt tensioner until belt deflection is 0.25 inch (item 1 in Figure 5-3). Belt should be just tight enough to prevent slapping.
3. Tighten locking screw (item 3 in Figure 5-3).

6.4.2. SHUTTER TIMING BELT

Refer to Figure 5-4 on page 5-5.

1. Loosen three screws securing adjust plate (item 5 in Figure 5-4).
2. Pull adjust plate (item 5 in Figure 5-4) up until belt deflection is 0.25 inch. It should be just possible to touch belt together at its midpoint.
3. Tighten screws firmly.

6.4.3. OUTER BELT

Refer to Figure 5-2 on page 5-3.

1. Loosen tensioner locking screw (item 7 in Figure 5-2).
2. Adjust outer belt tension until belt deflection of 0.25 inch is obtained. Belt should be just tight enough to prevent slapping.
3. Tighten screw (item 7 in Figure 5-2).

Shutter belt must be tensioned before outer belt is tensioned.

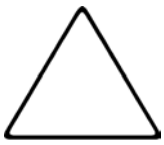
6.5. SHUTTER TIMING

Refer to Figure 5-4

1. Loosen shutter clamp screws (item 7 in Figure 5-4) just enough that shutter can be rotated on its shaft.
2. Turn projector by hand with motor flywheel until Ultramittent sprocket is in top position. Sprocket should not move while flywheel is being turned.
3. Use sharp pencil. Carefully rest pencil point on Ultramittent casting, pointing to one sprocket tooth.
4. Without moving pencil, turn projector by hand with motor flywheel until pencil is pointing at third tooth from starting tooth of Ultramittent sprocket.

Hold motor flywheel to ensure that projector does not turn over while rotating shutter.

5. Rotate shutter (item 4 in Figure 5-4) by hand until crosshairs are centered in aperture. Make certain shutter is not hitting anything.
6. Tighten shutter clamp screws (item 7 in Figure 5-4). Do not allow shutter to move on its shaft after centering crosshairs.
7. Recheck shutter timing.



CHRISTIE recommends that shutter timing also be checked whenever inner, outer or shutter timing belts have been removed or replaced.

6.6. THE CHRISTIE LENS TURRET

6.6.1. GENERAL DESCRIPTION

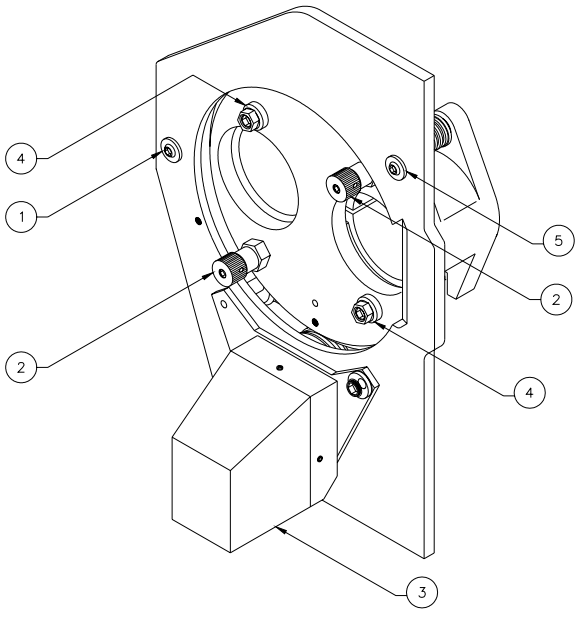
The CHRISTIE Turret System for the CineX35 Projector is a mechanical device holding two lenses in a rotating plate about a central axis.

6.6.2. THE MANUAL TURRET SYSTEM

The position of each lens is set manually by turning the rotating plate in the desired FLAT or SCOPE lens position. The aperture opening matching the lens is also set manually by moving the aperture handle on the trap and gate *up* for FLAT or *down* for SCOPE.

6.6.3. THE AUTOMATIC TURRET SYSTEM

The automatic turret is electronically driven by a DC motor that controls the movements of the lens holder and the aperture. The electronics are initiated by the automation. The interfacing is done through TB4 (see schematic p/n 503480). The switching from SCOPE to FLAT or vice versa is done with a pulse. The common terminal TB4-C is briefly connected to the SCOPE terminal of TB4-S to move the turret to the SCOPE lens position. A momentary connection between the COMMON and FLAT terminals TB4-F will move the turret to the FLAT lens position.



1: Eccentric, Guide Wheel Adjustment (197106-001)

2: Knob, Focus (197035-001)

3: Motor Cover (197124-001)

4: Eccentric, Adjustment and Lock (197036-001)

5: Standoff, V-Bearing (197104-001)

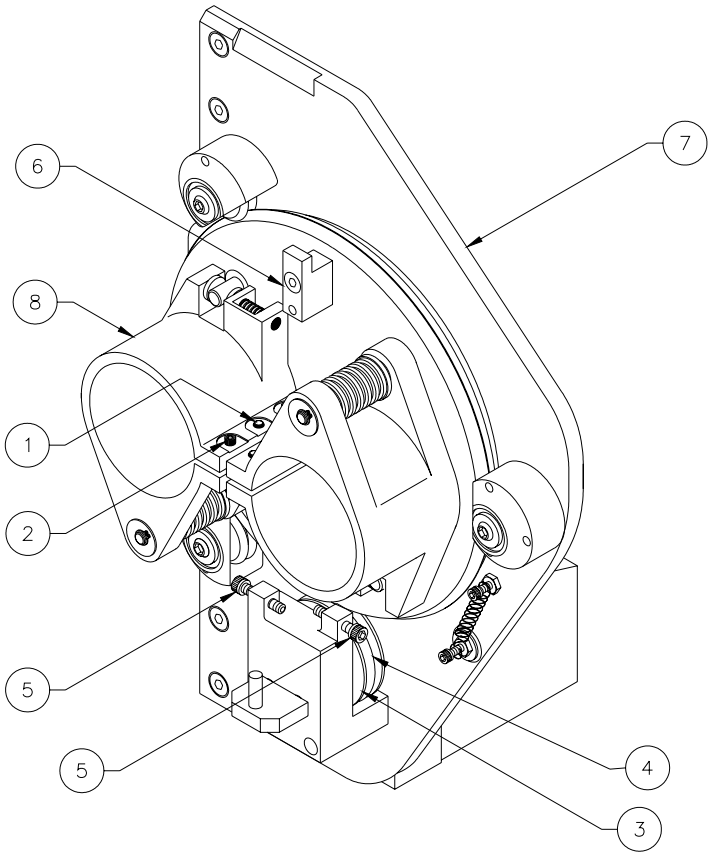
Figure 6-3: Lens Turret (Front View)

6.6.4. TIMING ADJUSTMENTS – TURRET AND APERTURE MOTOR

The turret motor and the aperture motor are controlled from the PC board, which is mounted on the non-operator side of the projector. Both motors are timed. One timer goes to the FLAT position; another timer goes to the SCOPE position. The on-time for the FLAT position is adjusted with a trimpot located at the lower side of the PC board.

When user is facing front of projector, lensholder plate rotates clockwise to SCOPE position and counter-clockwise to FLAT position. If lensholder plate turns in opposite direction, reverse quick-connects on turret motor.

Turning the trimpot clockwise shortens the time. The timing is set approximately 0.5 seconds longer than the time needed for the turret motor to turn the lensholder plate from the FLAT position to the SCOPE position and vice versa. The drive wheel will overrun for 0.5 second. The SCOPE on-time is adjusted in the same manner, using the trimpot located on the upper side of the PC board.



1: Jack Screw (515500-373)
2: Clamping Screw (515500-384)
3: Drive Pulley (197018-001)
4: Drive O-Ring (518734-191)
5: Vertical Adjust. Screws (515500-384)
6: Vertical Adjust. Stop (197113-001
7: Plate, Rotating (197111-001)
8: Lens Holder (197067-001)

Figure 6-4: Lens Turret (Rear View)

6.7. OPTICAL IMAGE ALIGNMENT AND ADJUSTMENT PROCEDURES

1. With FLAT lens removed from turret, center light image on screen.
2. Level console and projector.
3. Install FLAT lens and ensure that corners of screen go dark just as bulb becomes over-focused. If necessary, move projector head using mounting plate adjustments.
4. Run RP-40 loop; adjust so that projected image is level with respect to bottom and side masking.
5. Rotate lens turret and masking to SCOPE.
6. Run RP-40 loop.
7. Center projected image vertically, using stop adjustment, and laterally, using eccentric adjustment. Adjust so that projected image is level with respect to bottom and side masking.
8. With SCOPE image vertically centered on screen, rotate lens turret and masking to FLAT.
9. Center RP-40 image vertically, using stop adjustment, and laterally, using eccentric adjustment, to match SCOPE image settings.
10. Set focus knobs to the middle of travel range.
11. File aperture plates.

7

7. TROUBLESHOOTING PROCEDURES

Only technicians who are familiar with the installation and adjustment procedures described in previous sections of this manual should attempt to troubleshoot or repair a problem.

This section provides information for diagnosing and troubleshooting operational problems with the CineX35 projector. While it is impossible to foresee all problems that might occur, the procedures outlined in this section should assist in identifying the problem.

Checklists and troubleshooting tables are provided for the following areas:

- Motor
- Ultramittent Assembly
- Constant Speed Sprocket
- Belts
- Changeover Assembly
- Shutter Drive and Jackshaft system
- Trap and Gate Assembly
- Lens Turret.

For each of these areas, one or more symptoms are described. When more than one possibility for a symptom exists, it is generally more efficient to check causes in the order in which they are listed.

Where applicable, references to the appropriate section of this manual are provided to aid in repair, replacement, and testing.

7.1. MOTOR

7.1.1. SYMPTOM: MOTOR NOT WORKING

1. Check power to motor. Verify that projector is plugged in, and that manual switch is set to ON.
2. Check start capacitor.
3. Check for motor overheating/thermal shutdown. If motor is hot, wait until it has cooled off before attempting to restart.

7.2. ULTRAMITTENT ASSEMBLY

7.2.1. SYMPTOM: EXCESSIVE TICKING

Excessive ticking is indicative of a worn star or cam. Replace Ultramittent assembly (see Section 5.4.5).

7.2.2. SYMPTOM: EXCESSIVE FILM NOISE

1. Check for improper gate tension. Use adjustment knob at top of gate assembly to correct gate tension.
2. Check for improper shoe closure or alignment.
3. If excessive film noise continues, problem may be caused by worn Ultramittent sprocket. Replace Ultramittent assembly (see Section 5.4.5).

7.2.3. SYMPTOM: FILM INSTABILITY (JUMP)

1. Verify image alignment by running RP-40 loop and making adjustments as necessary (see Section 6.7).
2. Check for worn Ultramittent sprocket. There should be no sprocket movement when motor flywheel is manually turned with Ultramittent in rest position.

7.2.4. SYMPTOM: SHUTTER STREAKING

Time shutter (see Section 6.5).

7.3. CONSTANT-SPEED SPROCKET (MAIN FRAME ASSEMBLY)

The following paragraphs pertain to all constant-speed sprocket assemblies.

7.3.1. SYMPTOM: EXCESSIVE NOISE

1. Check for play in shaft or bearings. Adjust or replace as indicated.
2. Check for improperly aligned keeper or stripper. Realign as needed.
3. Check for loose pulley or sprocket. Tighten as needed.

7.3.2. SYMPTOM: FILM SPROCKET HOLE DAMAGE

Check for hooked or damaged sprocket. Replace as needed.

7.3.3. SYMPTOM: SPROCKET RIDING

1. Check alignment of pad roller. Adjust as needed.
2. Check pad roller arm spring. Repair or Replace as needed.

7.4. BELTS

7.4.1. SYMPTOM: EXCESSIVE NOISE

1. Check condition of all belts. Replace any belts that appear old, dry, or cracked.
2. Check tension of all belts. Adjust as needed (see Section 6.4).

7.4.2. SYMPTOM: EXCESSIVE BELT DUST

1. Check for worn or damaged pulleys. Replace as needed.
2. Check for worn or damaged idlers. Replace as needed.
3. Check condition of belts (see Section 7.4.1).

7.4.3. SYMPTOM: EXCESSIVE BELT FAILURE

1. Check condition of belts (see Section 7.4.1).
2. Check for worn or damaged pulleys. Replace as needed.
3. Check for worn or damaged idlers. Replace as needed.

7.5. CHANGEOVER ASSEMBLY

7.5.1. SYMPTOM: OPERATING INCONSISTENTLY

1. Check for faulty electrical connection. Repair as needed.
2. Check for mechanical binding or misalignment. Adjust or replace as needed.

7.5.2. SYMPTOM: NOT OPERATING

1. Check for faulty electrical connection. Repair as needed.
2. Verify power to assembly.
3. Check for open solenoid coil.
4. Check for mechanical binding.

7.6. SHUTTER DRIVER AND JACKSHAFT SYSTEM

7.6.1. SYMPTOM: EXCESSIVE NOISE

Remove shutter belt. Localize noise to driver or jackshaft.

1. Check rotation of bearings on shafts.
2. Replace defective component.

7.6.2. SYMPTOM: SHUTTER STREAK

1. Time shutter (see Section 6.5).
2. Check for worn pulleys. Replace as needed.
3. Check for excessively loose belts. Replace as needed.

7.7. TRAP AND GATE ASSEMBLY

7.7.1. SYMPTOM: EXCESSIVE JUMP AND WEAVE

1. Verify optical alignment with RP-40 loop (see Section 6.7).
2. Check lateral guide alignment and condition. Adjust or replace as necessary.
3. Check band tension and spring. Replace worn bands.
4. Verify that Ultramittent assembly is working properly (see Section 7.2).

7.7.2. SYMPTOM: APERTURE BINDING

1. Clean aperture track.
2. Remove trap and gate assembly to check operation (see Section 5.4.1).
3. Adjust guide rails for smooth travel.
4. Check aperture drive motor with another trap and gate assembly.

7.8. LENS TURRET

7.8.1. SYMPTOM: NOT ROTATING

1. Verify module power supply reading of 24 VDC (± 2 VDC).
2. Jumper control logic at turret module, connector TB4.
3. Latch K4 to opposite position and retry.
4. Verify 24 VDC at turret motor.

7.8.2. SYMPTOM: FOCUS KNOB INOPERATIVE

1. Lens clamping screws too tight. Adjust as necessary.
2. Focus adjustment threaded out of range.
3. Bushing are binding on lens barrel shafts.

7.8.3. SYMPTOM: TURRET HINGE TOO LOOSE OR TOO TIGHT

Adjust hinge.

Appendix A

APPENDIX A: REPLACEABLE ASSEMBLIES AND COMPONENTS

Part Number	Description	Section
197136-001	Douser Blade Kit	5.4.7
119450-005	Ultramittent Assembly	5.4.5
197578-001	Ultramittent Shoe Closure Assembly	5.4.5
197579-001	Band for Trap and Gate	5.4.1
197566-001	Standard Aperture Plate	5.4.1
197566-003	Standard Undersized Aperture Plate	5.4.1
197136-002	Solenoid Kit	5.4.7
598931-635	Aperture Drive Motor	6.6.4
197510-001	Sound-head Assembly	5.4.6
197552-001	Trap and Gate Assembly	5.4.1
194697-XXX**	Single Blade Shutter Assembly	5.4.8
197135-001	Motor (60 Hz) Kit	5.4.9
197135-002	Motor (50 Hz) Kit	5.4.9
197551-001	Jackshaft Assembly	2.3(20)
197516-001	Pulley, 30-Groove (Ultramittent)	2.3(15)
194824-001	Jackshaft pulley, 16-Grove	2.3
197514-001	Motor Pulley, 24-Groove (60 Hz)	2.3(12)
197514-002	Motor Pulley, 29-Groove (50 Hz)	2.3(12)
194827-001	Shutter Driver Pulley, 12-Groove	2.3(14)
197090-001	Power Supply Assembly Sound Head	2.3(16)
197084-001	Dual LED Regulator	2.4(26)
598931-688	Constant-Speed Sprocket	B-5(19)
197566-002	Aperture Plate Pinhole	5.4.1
197580-001	Auto Turret Control Assembly	2.3(25)

Part Number	Description	Section
197513-001	Jackshaft Pulley 20 Grove	5.2(5)
197137-XXX*	Shutter Driver Assembly Kit	5.2(9)
196122-001	CCD Board Assembly	
196212-002	LED Solar Cell Assembly	
598931-177	Inner and Outer Belts	5.2(1)&5.3(1)
598931-215	Framing Lamp	
598931-277	Rubies for Lateral Guides	
598931-533	Shutter Timing Belt	5.4(1)
598931-704	Visible Red LED	
546101-012	Fuse, 1A, 250V, SLO-BLO	2.4(28)

*** See Figure B-6 Shutter Driver Assembly (P/N 197137-XXX)**

**** See Figure B-12 Single Blade Shutter Assembly (P/N 194697-XXX)**

Table A-1: CineX35 Projector Replaceable Assemblies and Components

Appendix B

APPENDIX B: DIAGRAMS AND PARTS LISTS

Appendix B contains diagrams and parts lists for these major components of the CineX35 motion picture projector:

1. Light Baffle and Changeover Assembly
2. Trap and Gate Assembly
3. Fixed Idler Assembly
4. Jackshaft Assembly
5. Main Frame Assembly
6. Shutter Driver Assembly
7. Outer Belt Tensioner Assembly
8. Inner Belt Tensioner Assembly
9. Soundhead Assembly
10. Idler Roller Assembly
11. Ultramittent Shoe Closer Assembly
12. Single Blade Shutter Assembly
13. Framing Knob Kit

B-1: LIGHT BAFFLE AND CHANGEOVER ASSEMBLY

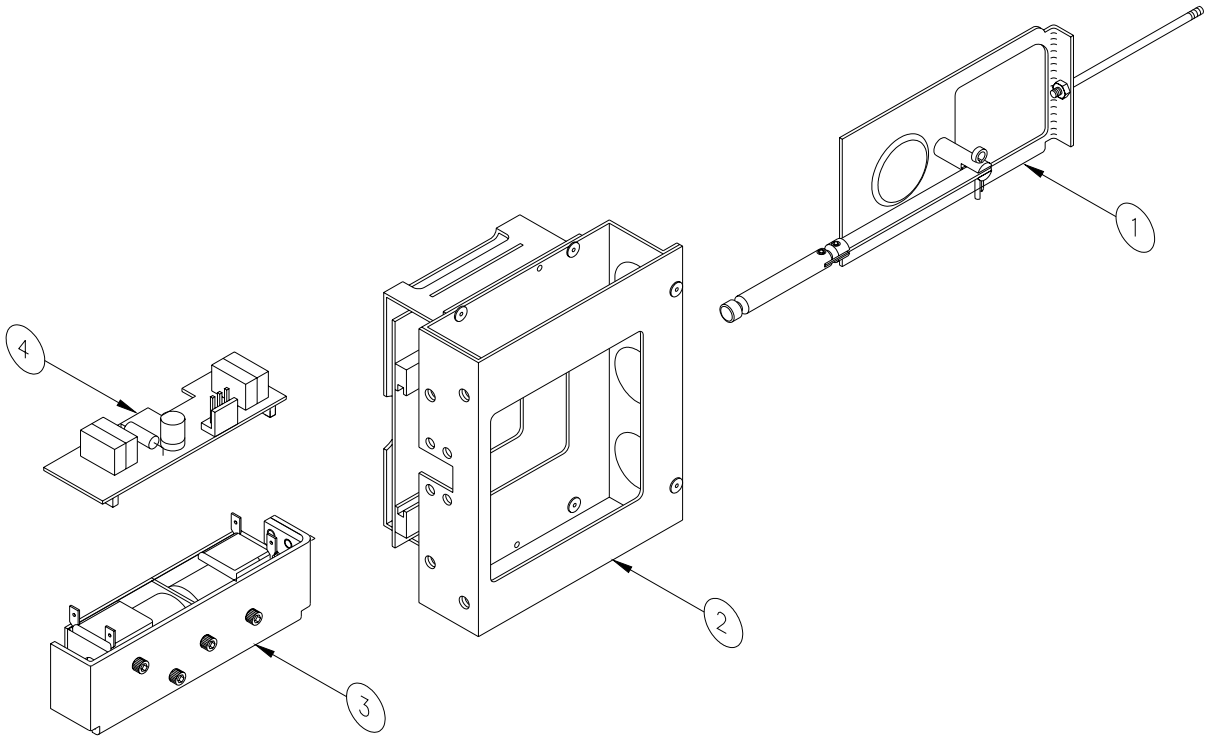


Figure B-1: Light Baffle and Changeover

#	Item Description	Part Number
1	Douser Kit	197136-001
2	Light Baffle	197532-001
3	Solenoid Kit	197136-002
4	PCB, Changeover	197082-001

Table B-1: Light Baffle and Changeover Assembly Parts List

B-2: TRAP AND GATE ASSEMBLY

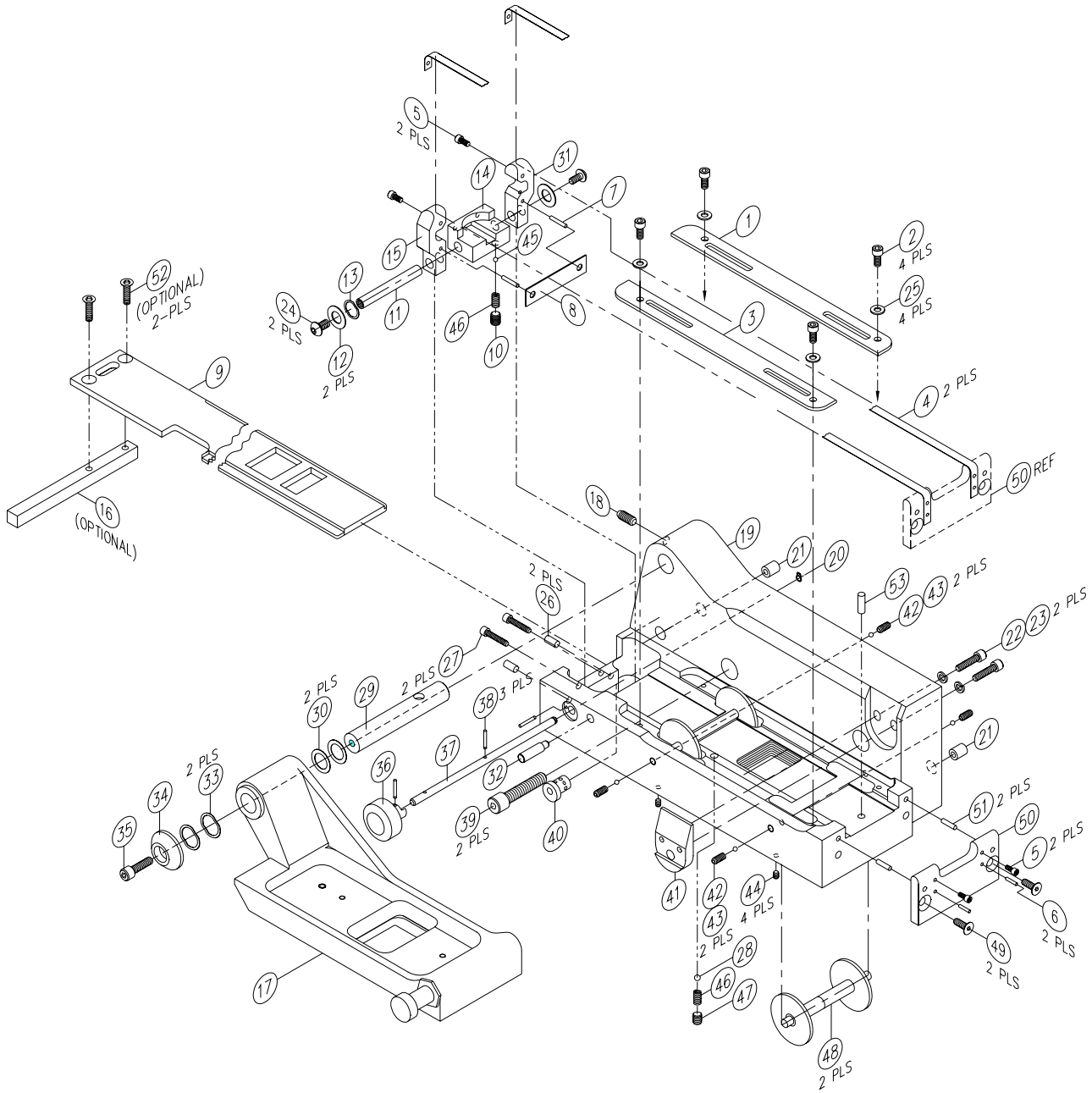


Figure B-2: Trap and Gate Assembly (P/N 197552-001)

#	Item Description	Part Number
1	Rail, Inner Guide	121158-001
2	Screw, SHC, 4-40 UNC x 0.25” L	598931-038
3	Rail, Outer Guide	121159-001
4	Band, Trap and Gate	197579-001
5	Screw, SHC, 2-56 UNC x 0.1875” L	598931-403
6	Pin, Spring, 0.0625” DIA x 0.25” L	598931-283
7	Pin – Spring	515380-041
8	Spring Band Tensioning	120679-001
9	Aperture Plate	197566-001
10	Screw, Set Hex 8-32 x 3/16” L	598931-023
11	Shaft	120678-001
12	Spacer, Precision Shaft	598931-338
13	Washer, Wave Spring, #10x.0057”	598931-339
14	Block Upper, Bends Connect	196147-001
15	Arm Upper End Band Connector	196452-001
16	Handle Aperture Shift (Optional)	197567-001
17	Gate Assembly	121224-001
18	Screw, Set, Cup PT 10-32 x 0.375” L	515500-410
19	Housing, Trap	197564-001
20	Ring, Retaining	598931-307
21	Bushing, Drill, .125 ID x.250 OD x .250” L	598931-488
22	Washer, Split Lock, #6	598931-083
23	Screw, SHC, 6-32 UNC x 0.5” L	598931-042
24	Screw, Button HD, HEX Socket 6-32x.25” L	598931-278
25	Washer, Flat, #4 SS	515819-102
26	Pin, Dowel, 0.125” DIA x 0.25” L SS	598931-404
27	Screw, SHC, 4-40 UNC x .437” L SS	515500-409
28	Ball Dia .156”	598931-785
29	Shaft, Gate	120666-001
30	Shim, Precision Shaft, 0.008”	598931-428
31	Arm Upper End Band Connector	196452-002
32	Screw, Stop Aperture Plate	197565-001
33	Washer, Curved Spring .375”	598931-318
34	Cap, Gate Shaft	120670-001

35	Screw, SHC, 8-32 UNC x 0.5” L	598931-044
36	Knob, Tensioning Band	120673-001
37	Shaft, Band Tensioning	120674-001
38	Pin, Spring, 0.0625” x .312” L	598931-306
39	Screw, SHC, ¼-20 UNC x 875” L	598931-539
40	Eccentric, Band Tensioning	120675-001
41	Plate, Catch	120663-001
42	Ball, Spherical Jewel, Ruby, 0.09375” DIA	598931-277
43	MTG Points, Lat Holds Ruby Bag	120158-001
44	Screw, Set, Brass Tip, 4-40 UNC x 0.125” L	598931-258
45	Ball, Hardened Steel, 0.125” DIA	598931-303
46	Spring, Compression, 0.120” OD, .018Wire .250” L	515610-062
47	Screw, Set, Slotted, 10-32 UNC x .187” L	121278-001
48	Guide Roller	598931-257
49	Screw, Flat HD Socket, 82°, 6-32 UNC x 0.375” L	598931-408
50	Plate, Lower End Band Connection	120661-001
51	Pin, Dowel, 0.0937” DIA x 0.25” L	598931-282
52	Screw, Flat HD Socket, 82°, 4-40 UNC x 0.375”	598931-407
53	Dowel Pin .125” x .375” STL.	598931-016

Table B-2: Trap and Gate Assembly Parts List

B-3: FIXED IDLER ASSEMBLY

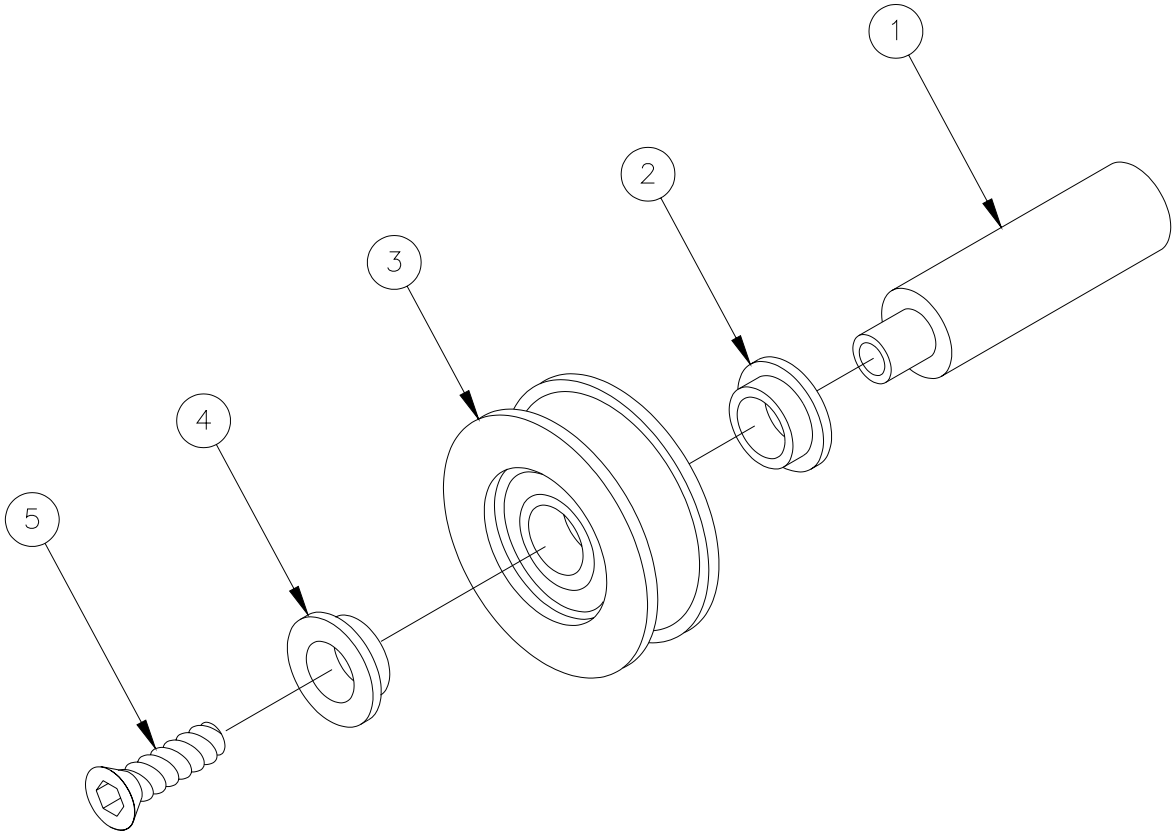


Figure B-3: Fixed Idler Assembly (P/N 194879-001)

#	Item Description	Part Number
1	Standoff	194740-003
2	Roller, Isolator	121120-001
3	Idler, Roller	194782-001
4	Retainer, Bearing	119061-002
5	Screw, Flat Head Socket, ¼-20 x 1.00” L	598931-256

Table B-3: Fixed Idler Roller Assembly Part List

B-4: JACKSHAFT ASSEMBLY

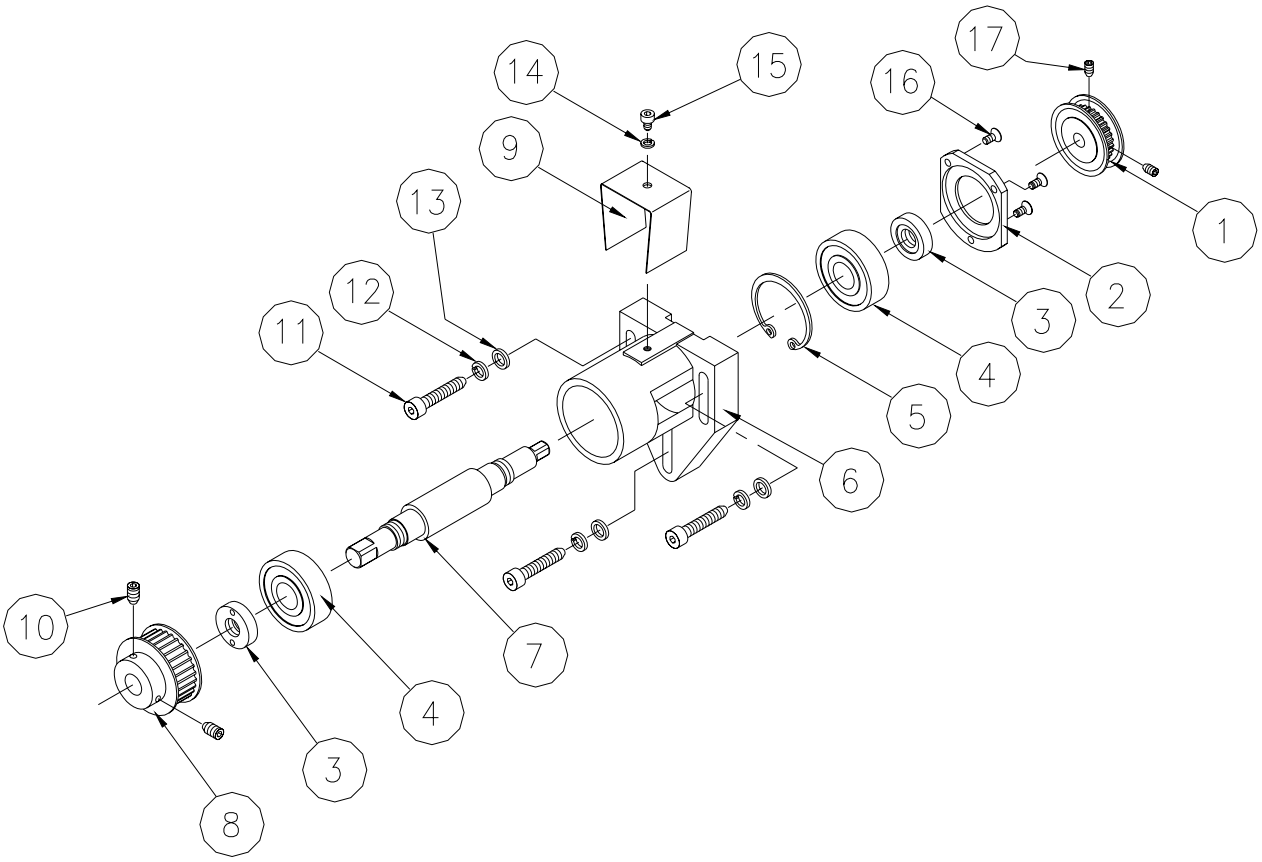


Figure B-4: Jackshaft Assembly (P/N 197551-001)

#	Item Description	Part Number
1	Pulley 16 Grooves	194824-001
2	Plate, Bearing Retainer	197127-001
3	Nut, Special M11x 0.50”	197126-001
4	Bearing, Ball NSK 6201 (12 x 32 x 10mm)	598931-250
5	Internal Retaining Ring 32mm	515700-135
6	Housing, Jackshaft	196469-001
7	Jackshaft	196484-001
8	Sprocket 20 Grooves	197513-001
9	Cover, Housing, Jackshaft	197125-001
10	Screw, Set Hex 10-32 x 0.25”	598931-292
11	Screw, SHC 10-32 x 1.00” SS	598931-197

12	Washer, Lock, Split, #10 SS	515819-403
13	Washer, Flat #10 SS	515819-401
14	Screw, SHC M3 x 6	515500-510
15	Washer, Lock, Split M3, SS	515819-333
16	Screw, Flat Hex Dr. M3x6	515500-509
17	Screw, Set 6-32 x 0.25” Hex Drive	515500-416

Table B-4: Jackshaft Assembly Parts List

B-5: MAIN FRAME ASSEMBLY

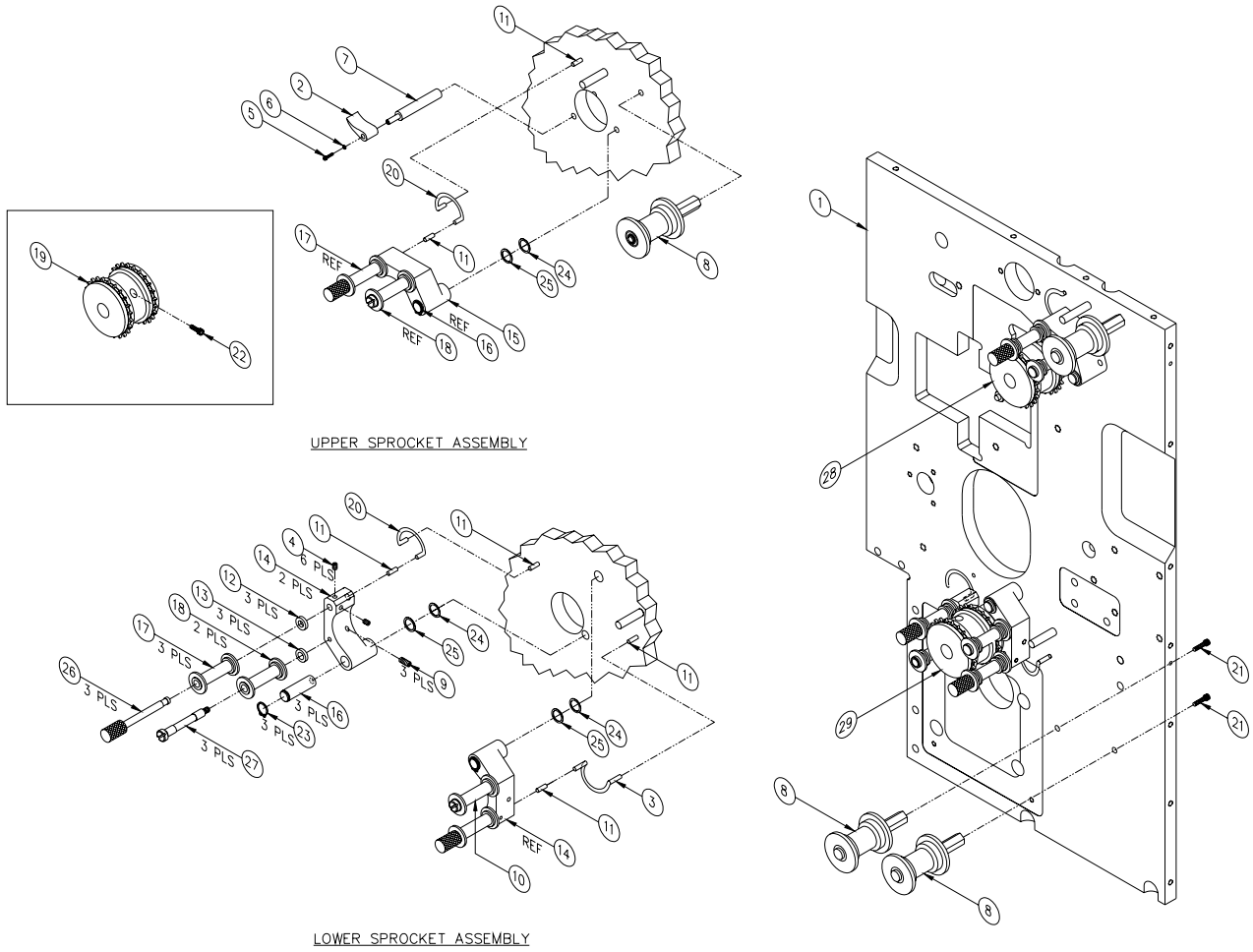


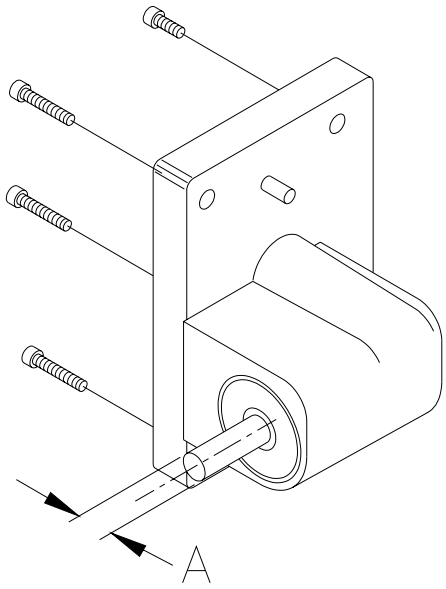
Figure B-5: Main Frame Assembly (P/N 197560-001)

#	Item Description	Part Number
1	Plate, Main Frame	197501-001
2	Stripper	119197-001
3	Spring, Pad Arm	194708-001
4	Screw, Set 6-32 x 3/16” L SS	598931-022

5	Screw, Socket Cap 4-40 x 3/8” L SS	598931-039
6	Washer, Flat #4 SS	515819-102
7	Post, Stripper	194983-001
8	Film By Pass Roller Assembly	197085-001
9	Screw, Set 8-32 x 3/8” L SS	515500-381
10	Roller Pad	197509-003
11	Spring Holder, Arm	194985-001
12	Spacer, Pad Roller, .225”/.221”IDx.438”ODx.097”	196467-001
13	Spacer, Pad Roller, .255”/.251”IDx.438”ODx.097”	196467-002
14	Arm, Pad Roller	197503-001
15	Arm, Pad Roller	197503-002
16	Shaft, Pad Roller Arm	197505-001
17	Roller Pad, .223” / .221” ID	197509-001
18	Roller Pad, .255” / .253” ID	197509-002
19	Film Sprocket Modified	598931-688
20	Spring Arm, Pad Roller	197535-001
21	Screw, SHC 10-32 x 5/8”	598931-049
22	Screw, SHC 10-32 x .500” L SS	598931-048
23	Retaining Ring, Ext. 3/8” ID	598931-155
24	Shim Spacer, .378” ID x .490” OD x .007” THK	598931-065
25	Shim Spacer, .378” ID x .490” OD x .020” THK	598931-066
26	Pad Roller Shaft, (Stud-Knob Assy).2177/.2172Dia	598931-116
27	Shaft Pad Roller, .250” Dia W/Dry Lube Finish	598931-114
28	Upper Sprocket Kit	197592-001
29	Lower Sprocket Kit	197593-001

Table B-5: Main Frame Assembly Parts List

B-6: SHUTTER DRIVER ASSEMBLY



PART NUMBER	DIMENSIONS	
	INCHES	METRIC
197137–001	.250"	–
197137–002	.256"	6.5MM

NOTE: TO ORDER CORRECT PART NUMBER MEASURE SHAFT DIAMETER (A), PLEASE SEE CHART.

Figure B-6: Shutter Driver Assembly Kit (P/N 197137-XXX)

B-7: OUTER BELT TENSIONER ASSEMBLY

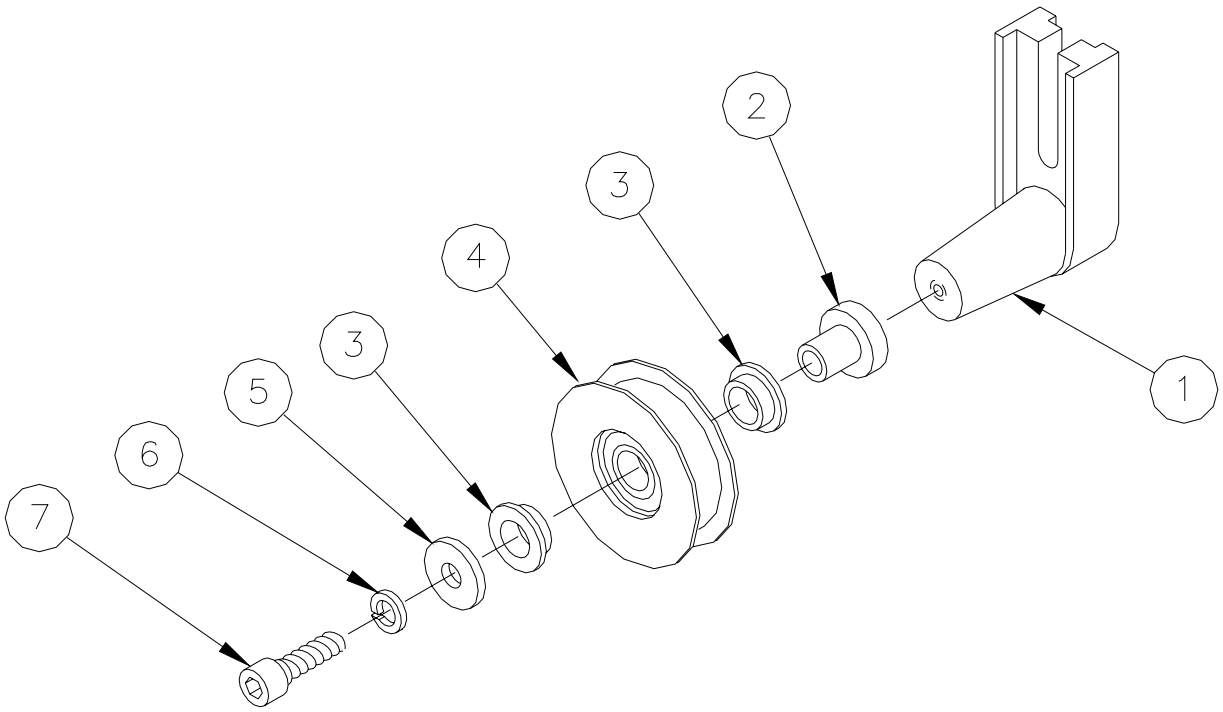


Figure B-7: Outer Belt Tensioner Assembly (P/N 197583-001)

#	Item Description	Part Number
1	Base, Inner Belt Tensioner	194905-001
2	Standoff	119060-001
3	Roller, Isolator	121120-001
4	Smooth Idler Roller Assembly	194782-001
5	Cap	119150-001
6	Washer, Lock, Split, 0.25” ID	515819-503
7	Screw, SHC, ¼-20 x 1.00” L	515500-104

Table B-7: Outer Belt Tensioner Assembly Parts List

B-8: INNER BELT TENSIONER ASSEMBLY

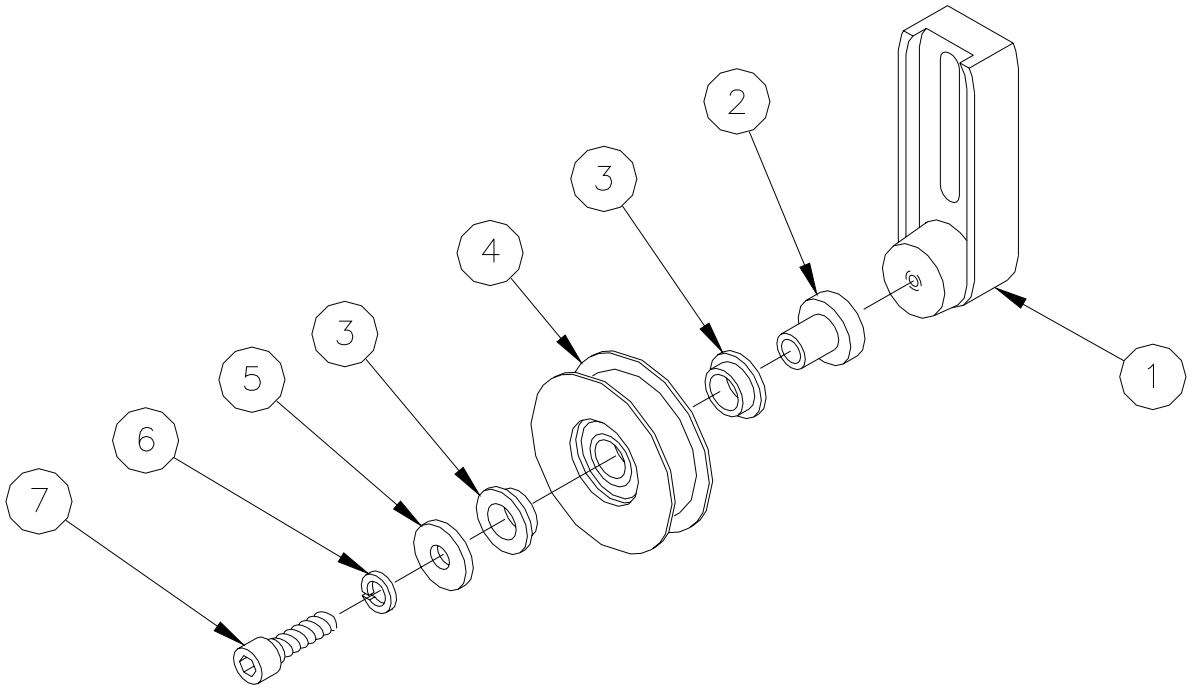


Figure B-8: Inner Belt Tensioner Assembly (P/N 196056-001)

#	Item Description	Part Number
1	Base, Inner Belt Tensioner	194905-002
2	Standoff	119060-001
3	Roller, Isolator	121120-001
4	Smooth Idler Roller Assembly	194782-001
5	Cap	119150-001
6	Washer, Lock, Split, 0.25” ID	515819-503
7	Screw, SHC, ¼-20 x 1.00” L	515500-104

Table B-8: Inner Belt Tensioner Assembly Parts List

B-9: SOUNDHEAD ASSEMBLY

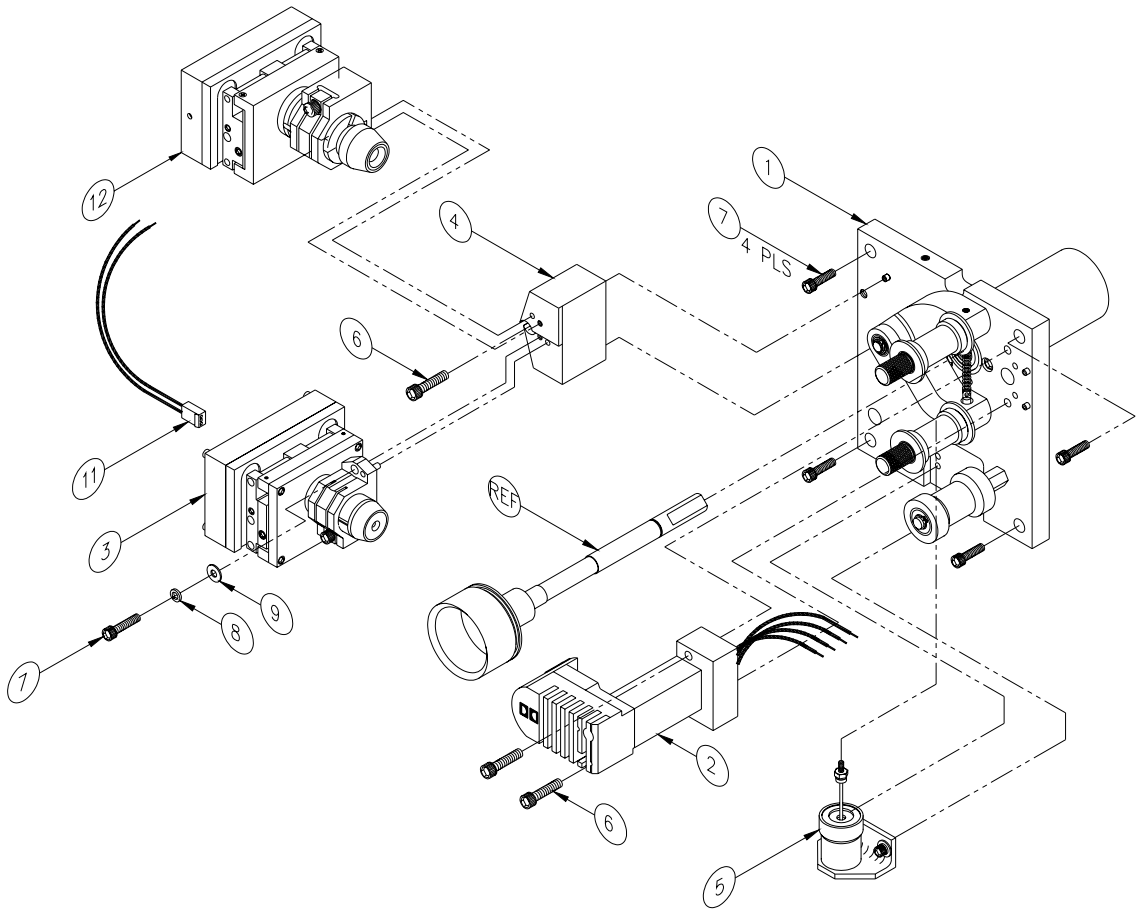


Figure B-9: Soundhead Assembly (P/N 197510-001)

#	Item Description	Part Number
1	Base Plate Assembly, Soundhead	197582-001
2	Dual LED Mount Assembly	197585-001
3	Analog Reader Assembly	197569-001
4	Mount Bracket Analog & Digital Reader	196191-001
5	Airpot – Snubber	598931-783
6	Screw, SHC Hex 10-32 x .750”	598931-002
7	Screw, SHC 8-32 x .625”	515500-100

8	Washer, Split Lock #8 SS	515819-302
9	Washer, Flat #8 SS	515819-303
10	Connector .75” Strain Relief (Not Shown)	515900-036
11	Connector Assembly, Analog Soundhead	197573-001
12	Digital Reader Assembly (Optional)	197559-001

Table B-9: Soundhead Assembly Parts List

B-10: IDLER ROLLER ASSEMBLY

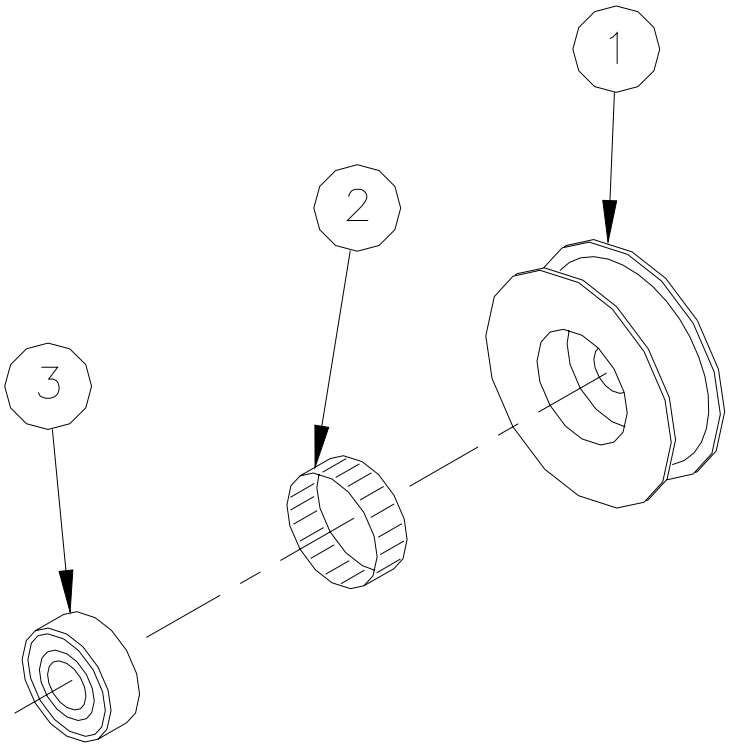


Figure B-10: Idler Roller Assembly (P/N 194782-001)

#	Item Description	Part Number
1	Roller Smooth	194791-001
2	Tolerance Ring AN-11203-S	598931-593
3	Ball Bearing .50” x 1.125” x .3125	598931-608

Table B-10: Idler Roller Assembly Parts List

B-11: ULTRAMITTENT SHOE CLOSURE ASSEMBLY

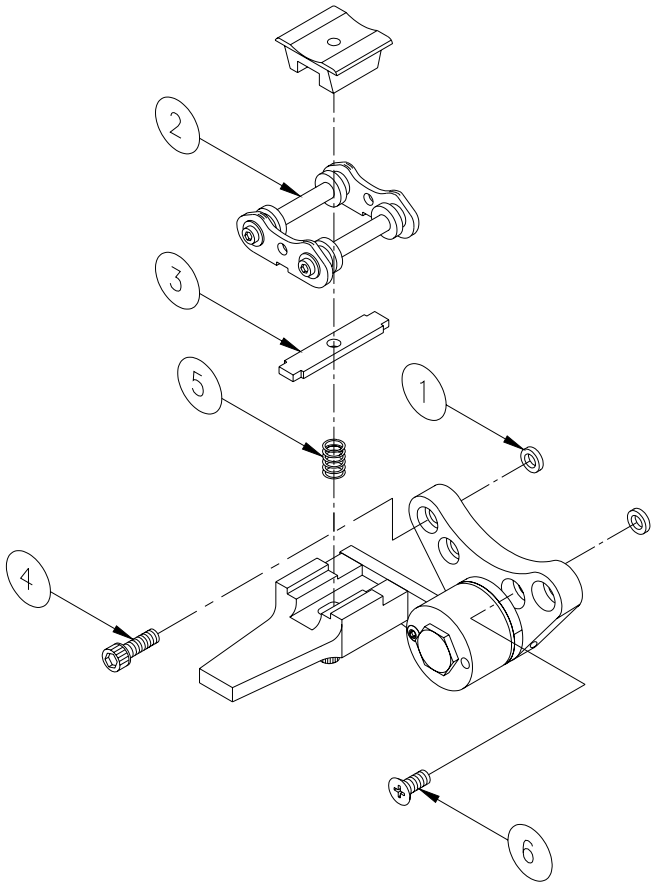
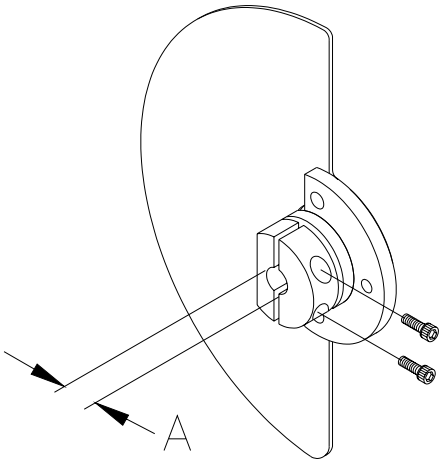


Figure B-11: Ultramittent Shoe Closure Assembly (P/N 197578-001)

#	Item Description	Part Number
1	Bushing Standoff	120655-002
2	Shoe Assembly, Delrin	196610-001
2	Shoe Assembly, Metal	598931-112
3	Balance – Bar	194840-001
4	Screw, Socket Cup Head 8-32 x .50”	598931-044
5	Spring Compression	598931-621
6	Screw, Flat HD. Hex Drive 8-32 x .375” SS	515500-234

Table B-11 Ultramittent Shoe Closure Assembly Parts List

B-12: SINGLE BLADE SHUTTER ASSEMBLY



PART NUMBER	DIMENSIONS	
	INCHES	METRIC
194697–001	.250"	–
194697–002	.256"	6.5MM

NOTE: TO ORDER CORRECT PART NUMBER MEASURE HOLE DIAMETER (A).

Figure B-12: Single Blade Shutter Assembly Kit (P/N 194697-XXX)

B-13: FRAMING KNOB KIT

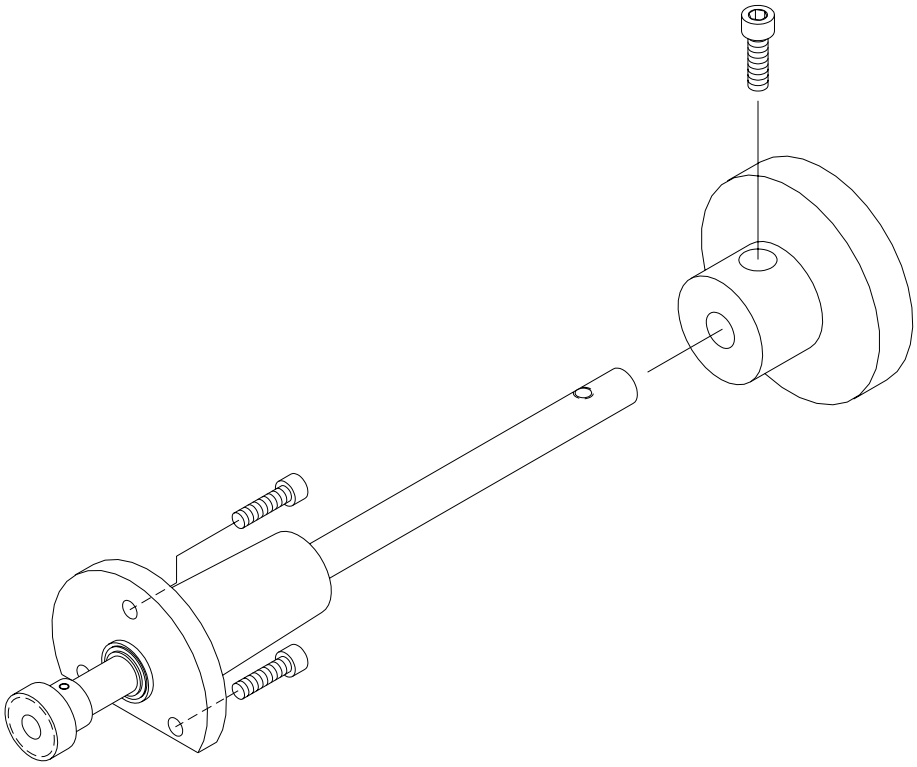


Figure B-13: Framing Knob Kit (P/N 197131-001)

Appendix C

APPENDIX C: SCHEMATIC DIAGRAM

Table C-1 Lists the schematic for the CineX35 Projector that is included with this manual.

Diagram	Part Number
Projector Wiring Diagram	503480

Table C-1 Schematic Diagram for CineX35 Projector

Schematic 503480 is oversize, and is found at the back of the manual.

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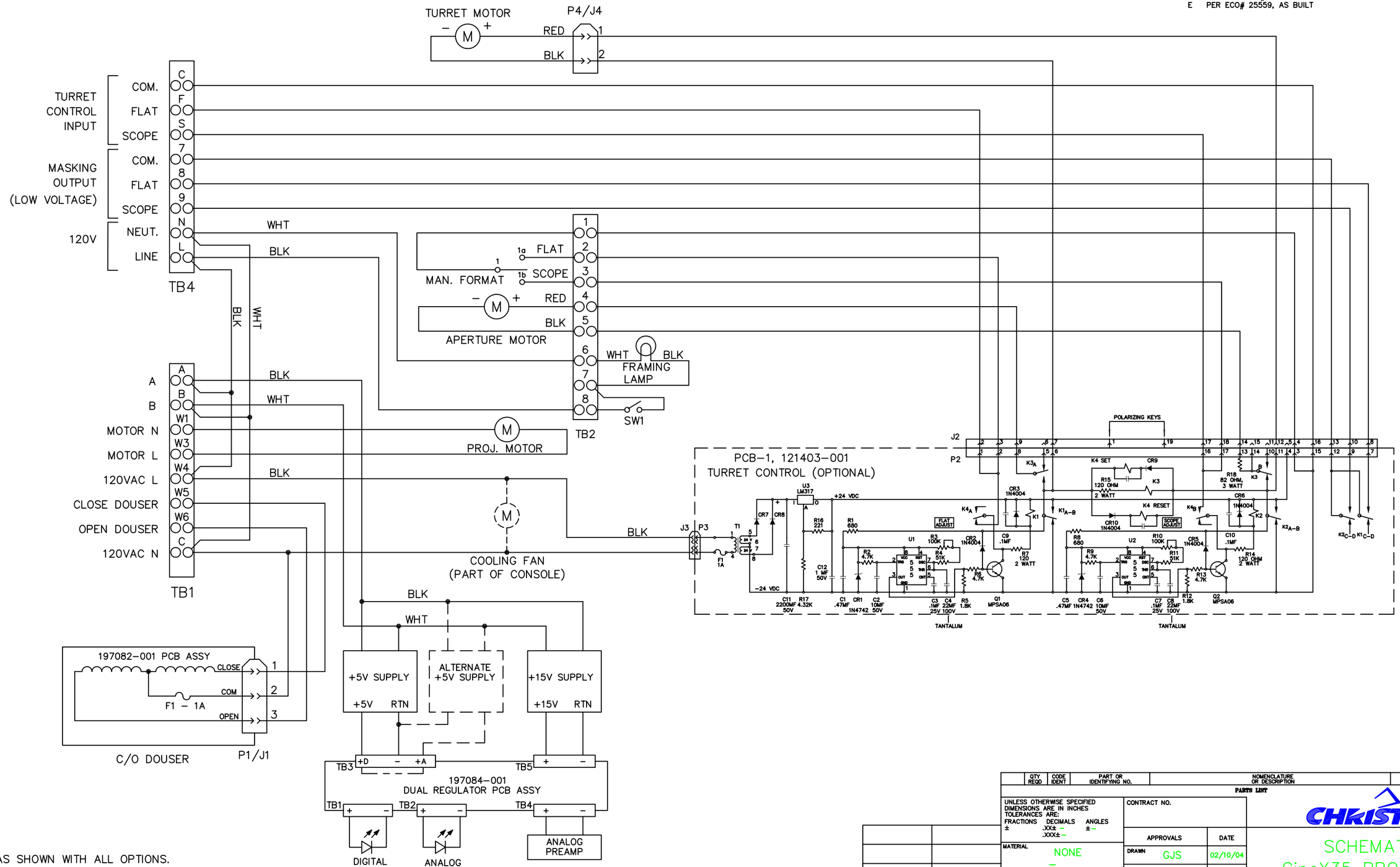
REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	ORIGINAL ISSUE	07/01/02	GJS
	B	REV. PER ECO# 25186	10/18/02	GJS
	C	REDRAW ON D-SIZE	06/12/03	DSR
	D	REV. PER ECO# 25330	02/10/04	GJS
	E	PER ECO# 25559, AS BUILT	06/09/04	GVB



1. AS SHOWN WITH ALL OPTIONS.

NOTES: UNLESS OTHERWISE SPECIFIED

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO.

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX± – .XXX± – ANGLES ±–

MATERIAL: NONE –

FINISH: NONE –

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN GJS	02/10/04
CHECKED	
APPROVED	
ISSUED	

NEXT ASSY	USED ON
–	CineX35
APPLICATION	

CHRISTIE

SCHEMATIC
CineX35 PROJECTOR

SIZE	CAGE NO.	DWG. NO.	REV
D		503480	E

SCALE 1:1 SHEET 1 OF 1

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WARRANTY

COVERING

CineX35 PROJECTOR

Manufactured by: CHRISTIE DIGITAL SYSTEMS

(Herein referred to as **"Christie"**)

Christie warrants the apparatus sold to the extent of the parts necessary to correct any defect in workmanship or materials which may develop under proper and normal use for a period of one (1) full year (90 days on electric motors) from the date of installation (except as noted below) but not to exceed eighteen (18) months from the date of shipment from CHRISTIE DIGITAL SYSTEMS.

Christie reserves the right to have the apparatus returned, freight prepaid, to Christie factory to effect the warranty repairs.

Replacement parts for warranty repairs will be shipped promptly by Christie f.o.b. factory, and invoiced to the customer. Credit will be issued upon return of the defective part(s), prepaid, to the Christie factory.

The above shall constitute a fulfillment of all Christie liabilities in respect to said apparatus.

This warranty does not cover:

Special customer specified purchased parts, materials, or components modified to customer specifications.

This warranty does not apply to parts of any Christie product, which have been opened, disassembled, repaired, or altered by anyone other than Christie, or subjected to misuse or abuse.

Christie shall not be liable for any consequential damages.